

JULY '57

# MODERN TEXTILES

MAGAZINE

*Specializing in Man-Made Fibers and Blends since 1925*

FIBERS

FABRICS

FINISHES



**EDWIN**

*STOECKEL'S life-  
time in silk manu-  
facturing--*

*no one got rich.*

*For his story*

*see page 33*

## THIS MONTH'S SPECIAL FEATURES

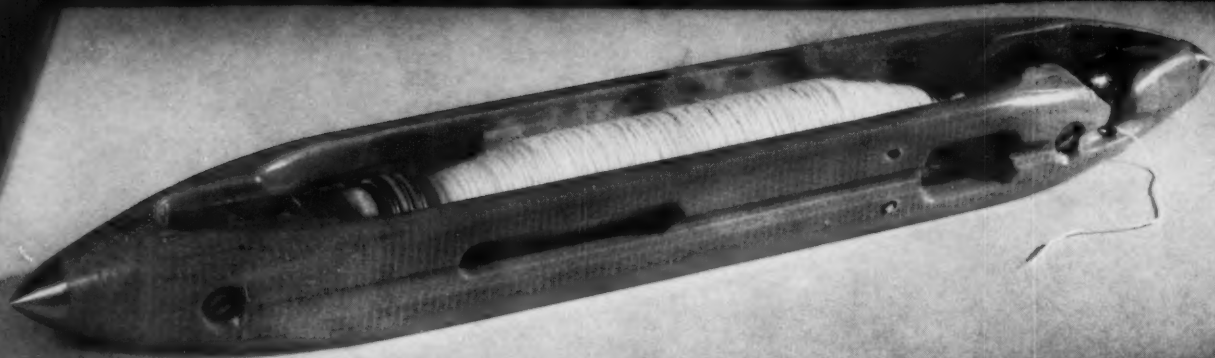
Spinning Dacron-wool yarns

Latest knitting developments

Durable antistatic finishes

Quill-winding improvements

AND 13 MORE EXCLUSIVE REPORTS AND HELPFUL ARTICLES



## Better than 12,000 hours . . .

that is the remarkable performance of one Draper Tru-Mold Shuttle in actual mill use.

Operating under similar mill conditions the average life of a group of Tru-Mold Shuttles is over 6,000 hours.

The use of superior materials and new manufacturing methods make such shuttle life possible.

The Tru-Mold is the only shuttle in which the tips *are molded as an integral part of the product*. This eliminates the chance of shuttle tips becoming loose.

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*shuttle fittings stay in position* and a greater uniformity of product can be maintained.

For longer shuttle life — greater shuttle economy — equip your weave room with Draper Tru-Mold Shuttles.



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For Fullest Bloom... by any  
Accepted Bulking Process

...caprolan<sup>®</sup>†

Stuffing  
Box

Heated  
Surface

Twist-  
Untwist

Airjet

*More Cover with Less Poundage  
for Carpet and Upholstery*

Have you looked into bulked yarns? For the greatest possible loft . . . from each of today's four main bulking methods . . . two unique Caprolan factors will interest you.

First, Caprolan can be engineered in original deniers from 2,000 to 50,000, instead of combinations of plied yarns. This means putups require no twist, filaments are parallel when bulked, final loft is uniform over the length of the yarn.

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Man-Made Fiber Producers  
Association ..... Empire State Bldg., New York  
National Federation of Textiles,  
Inc. .... 389 Fifth Ave., New York  
American Association of Textile Chemists and  
Colorists ..... Lowell Techn. Inst., Lowell, Mass.  
American Association for Textile  
Technology, Inc. .... 100 W. 55th St., New York  
Silk and Rayon Printers and Dyers Ass'n  
of America, Inc. .... 1450 Broadway, New York  
Synthetic Organic Chemical Manufacturers  
Association ..... 41 E. 42nd St., New York  
Textile Distributors Institute,  
Inc. .... 469 Seventh Ave., New York  
American Rayon Institute  
350 Fifth Avenue, New York

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## Cheney Honored on Retirement

Roy Cheney, who retired recently as president of the Underwear Institute, was honored at the annual dinner of the Institute in Atlantic City on April 29. Several hundred friends and associates in the textile industry and from the armed forces and government attended the affair.

A number of guest speakers praised Mr. Cheney's long career on behalf of the interests of the underwear industry. Mr. Cheney was presented with a silver tea set by members of the Institute in recognition of his many years of distinguished service.

Mr. Cheney became associated with the underwear industry in 1919 when he was appointed secretary of the Knit Goods Manufacturers Association. The name of this organization was later changed to Underwear Institute and Mr. Cheney was made president in 1939. In the future he will make his home in Fishers Landing, N. Y. To succeed him Robert D. McCabe has been appointed managing director of the Underwear Institute.

## Corn Starch Fiber on Way?

Plastic materials and coatings for textiles, made from corn starch containing 70% amylose, have been developed at Purdue University, Lafayette, Indiana. The plastics can be used in many fields now employing cellulose derivatives. A new synthetic fiber may also eventually be made by this process. But transference of the corn to high-yielding hybrids is expected to take two to three years. To spin fibers from corn starch requires an amylose content of 90 to 100%. Ordinary corn starch is a mixture of about 25% amylose, a long thread-like molecule, and 75% amylopectin, a bush or tree-shaped molecule. Commercial dyes have been used successfully on the fiber.

## Carpet Yarn Splicing

A new technique in splicing yarns of carpet nylon allows continuous tufting operations in a carpet mill with a minimum of interruptions due to splice failure. The new technique was developed by Du Pont's textile fibers department in cooperation with leading carpet yarn spinners and carpet makers. The splice resulting from the new technique is said to supply carpet tufters with a neat, strong yarn joint that is extremely effective with carpet yarns of 100% Du Pont carpet nylon. *For further information write the editors.*

## Von Kohorn Developments

Recent activities of the Von Kohorn International Corp., White Plains, N. Y., include construction of a 50,000,000-pound per year viscose plant at Loznica, Serbia, for the Yugoslav Government. Production of rayon yarn, rayon staple, tire yarn and cellophane in the \$25,000,000 plant is scheduled shortly.

Other developments announced by Henry Von Kohorn, president, include: construction begun by Acetafil, S. A., Havana, Cuba, on a Von Kohorn-designed and equipped acetate filament and staple plant on the outskirts of Havana; the \$6,000,000 viscose filament plant of China Artificial Fiber Corp., at Towfen, Taiwan, has begun production; commercial scale production of alkali cellulose on Von Kohorn continuous equipment has started at the plant of Kalle & Co., in Germany; the viscose filament plant put up for Century Rayon Co., a Birla subsidiary in India, has reached full production at the rate of 4,000,000 pounds annually; and Yamaichi Cellophane Co., a subsidiary of Toho Rayon Co., Japan, has contracted for the installation of a Von Kohorn-designed cellophane casting machine.

# The word for rayon **HARTFORD** the symbol of dependability

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- White heavy denier crimped rayon staple . . . VISCALON 66†
- White heavy denier "smooth" rayon staple . . . VISCALON 44
- White fine denier regular rayon staple . . . . . VISCALON 22

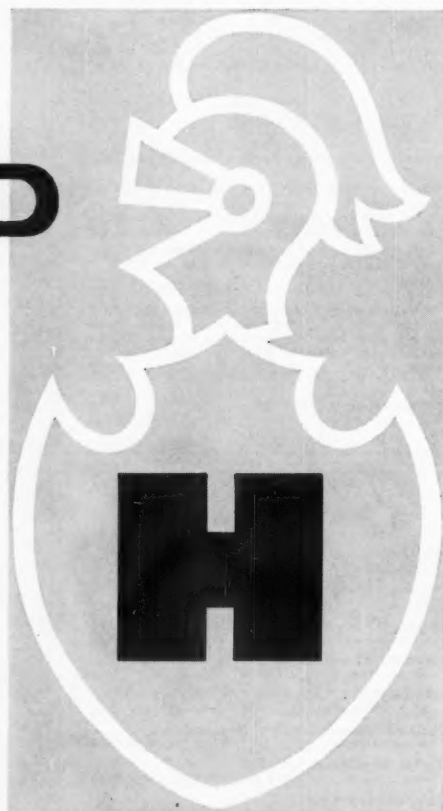
†Available in both 3" and 6" lengths

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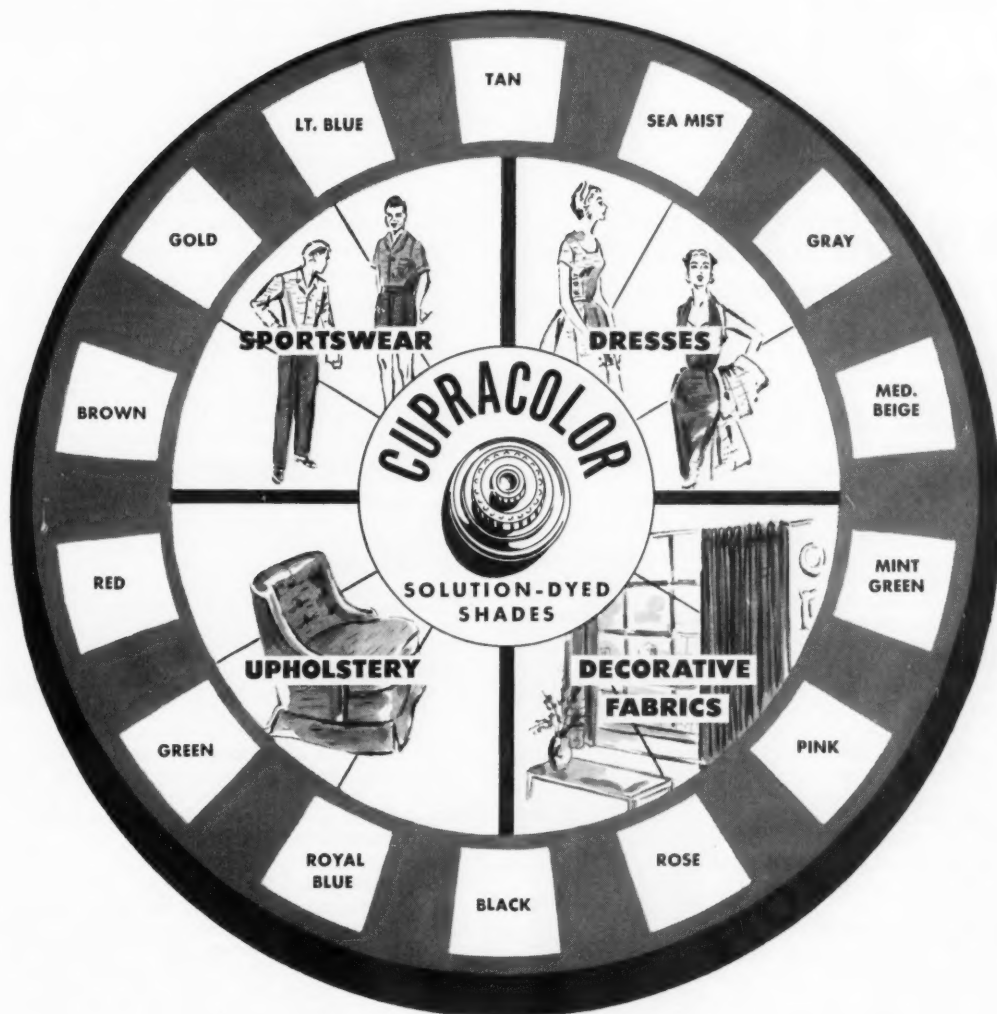
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Cupracolor solution-dyed shades now add a new, powerful sales feature to Cupioni, the sensational rayon yarn with the shantung look, and Strata, an unusual thick-and-thin with a high-fashion texture.

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Only complete, authoritative bobbins guide in the industry

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## Duty-Free Carpet Wools Asked

The Carpet Institute, Inc. and the New York Wool Trade Association have both endorsed a bill now before Congress which would broaden the supply of duty-free wool imports. The bill, HR2151 would permit the duty-free entry of wools up to grade 46's for carpet manufacturing. Carpet Institute president Paul M. Jones has stated "our industry must have these wools to be able to continue offering wool carpets and rugs in sufficient quantities to meet current and future demands of the American consumer." Other groups supporting the measure include the National Retail Dry Goods Association and the National Retail Furniture Association.

## The Future: One Man's Viewpoint

Unless trends of the past eight years change materially, the textile business in 1960 will be so basically revolutionized that it will bear little resemblance to the present, according to Willard C. Wheeler, vice president of Anderson & Cairns, Inc., advertising agency.

Wheeler painted this picture in an analytical report on trends in U. S. mill consumption of fibers projected to 1960: Use of man-made fibers, rayon and acetate and silk will increase in terms of percent of total poundage, while cotton and wool will decrease. Continuation of a downward price trend for the newer man-made fibers will force downward the average price of all fibers and narrow the range between the highest and lowest. Synthetics will exceed 50% of the total spent for all fibers.

Based on percent of dollars spent for each fiber, Wheeler noted: Wool would reach an all-time low; cotton would be on a par with its lowest levels in history; silk would have an established "beachhead;" acetate and rayon would be on a level with its all-time high, and other man-made fibers would be the chief competition of cotton.

Wheeler emphasized that his projections are not to be taken as forecasts, but only as indications of what will happen if nothing occurs to change the trends as they now are moving. Many people in the industry, he points out, will undoubtedly be exerting efforts to make changes.

## Wool Decline Publicized

The National Association of Wool Manufacturers has launched an education campaign based on a booklet, "Danger Ahead—50% Contraction in the Wool Textile Industry." The booklet points up the 50% loss in machinery since 1946, the rapid rise of low-wage imports and warns that rising imports could result in more mill liquidations. It states "there is grave doubt the industry today could meet mobilization needs."

The booklet is tied in with NAWM's preparations for hearings, scheduled to start June 3 in Washington, by the Office of Defense Mobilization to determine whether wool textile imports pose a threat to national security.

At the 92nd annual meeting of the NAWM in New York at which the educational campaign was launched on May 9, John P. Stevens, Jr., chairman of J. P. Stevens & Co., Inc., was elected president. Martin M. Concagh, of the same firm, was named chairman of the Collateral Group.

## Japanese Fashions Imported

The first original collection of high couturier Japanese fashions to arrive in this country since the recently established U. S. quota for textiles, dresses and other finished fabrics, was recently exhibited in New York by Hess Brothers, Allentown, Pa., department store. According to Hess the 30 million yards of finished goods set as the import quota should be diverted only to high style fashions rather than to low-priced, mass-produced items.





# COMFORT is

only one of  
the many  
"TASLAN"\*  
features...

One look at a recent DuPont display of finished materials made with "TASLAN"\* textured yarns processed on our new U. S. ACME TEXTURIZER and you know this new bulking process offers almost unlimited possibilities!

NOW YOU CAN TAKE ANY OF THE STANDARD TEXTILE YARNS (nylon, Dacron\*\*, Orlon\*\*\*, rayon, acetate and others—or any combination of filament yarns) AND TEXTURE THEM TO INTERESTING NEW FORMS! Their qualities and selling features speak for themselves in wearing apparel for men, women and children, plus piece goods and upholstery and drapery fabrics.

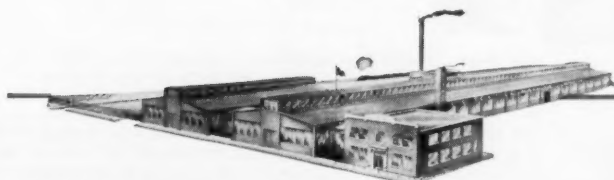
Texturing of standard filament yarns creates a new lightweight comfort in fabrics that "breathe" and do not lie close to the skin . . . more bulk with less weight! A new, pleasing, subdued lustre introduces a luxury appearance different from regular filament yarns.

Get your share of this vast new market . . . with an installation of the new U. S. ACME TEXTURIZER—the first efficient production unit for "TASLAN"\* textured yarns. 60-spindle machines are now being built in production for both the wet or dry process of texturing twisted or untwisted filament yarns.

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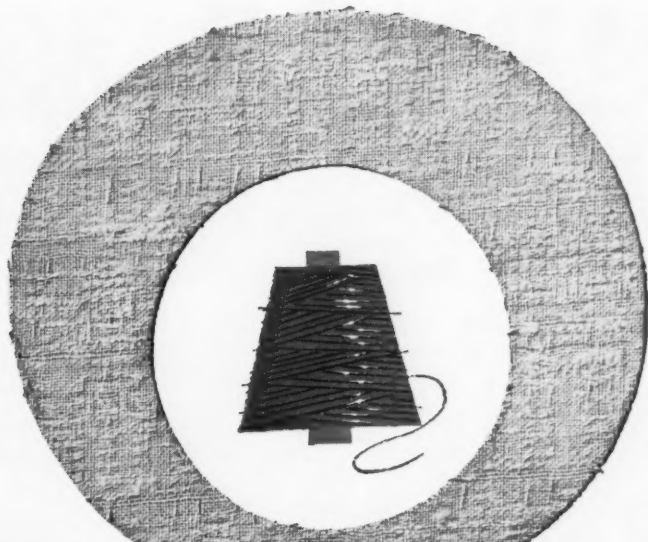
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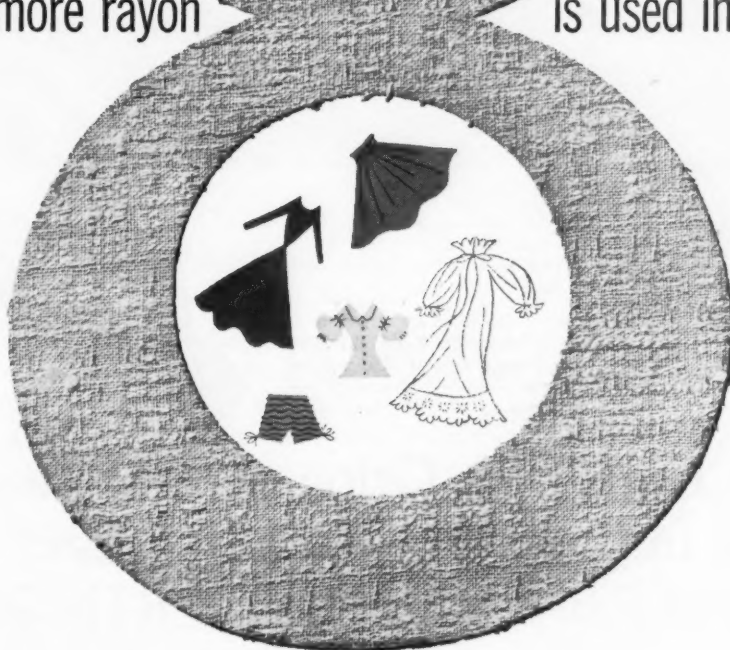
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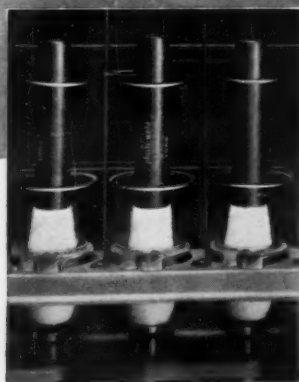
Only those blended fabrics that contain Avisco rayon fibers and meet the requirements of the Avisco Integrity Program qualify for the Avisco Integrity Tag. No matter what else is in the blend, your customer is buying the wonderful advantages that only rayon can give. This Tag is a trusted symbol of tested fabric performance.

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The HERR Conical Ring provides ideal conditions for the spinning or twisting of any yarn.

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Equip with HERR Conical Rings and begin to enjoy these profit making features. You can speed up production, improve quality and lower costs with HERR Conical Rings. You'll gain too, many other advantages. They stop yarn breakage, permit heavier dofs, produce smoother yarns and reduce

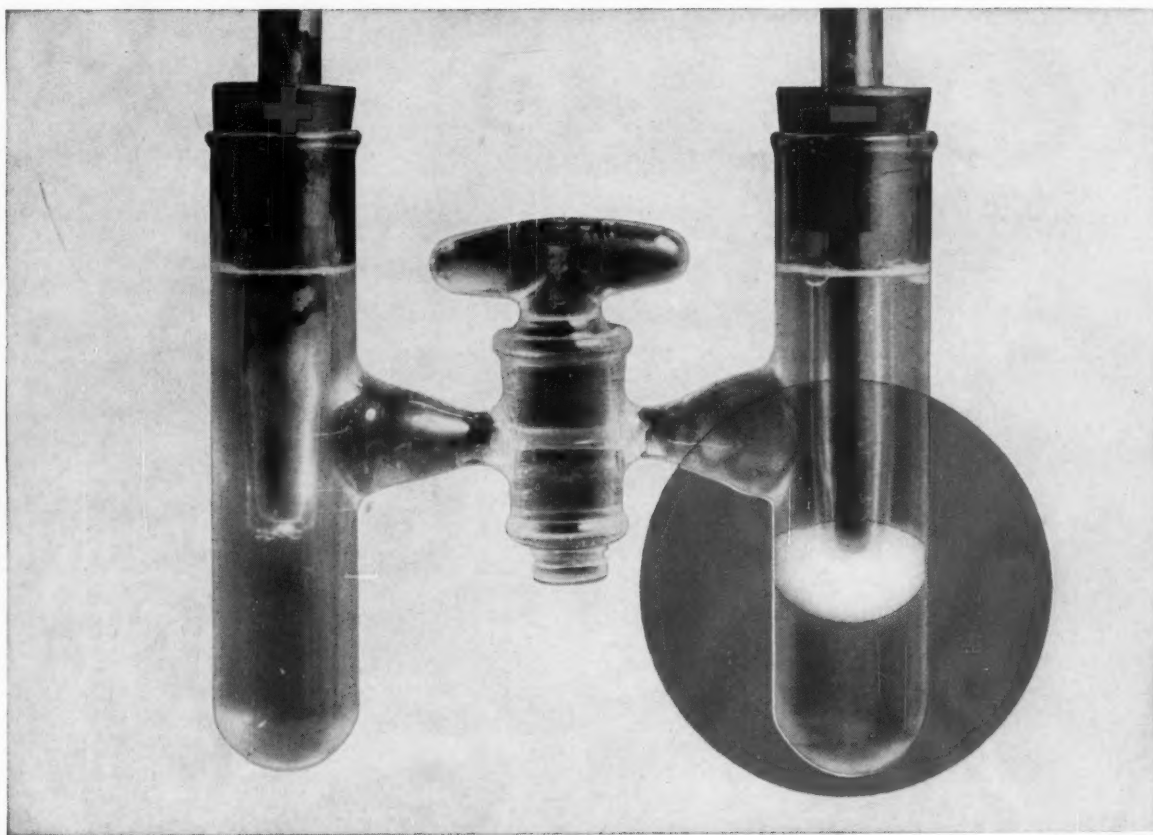
fly. You'll enjoy cleaner yarn because oil is not thrown off. Frames and room floors stay cleaner. Travelers last longer because oil is carried in capillaries to ring surfaces. Maximum spindle speeds are achieved.

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*This is an unretouched photograph.*

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CATO carries a cationic charge as an integral part of its polymeric structure. The result? A strong electrochemical affinity for negatively charged fibers—as proved by CATO's migration under applied potential to the cathode of the electrophoresis cell.

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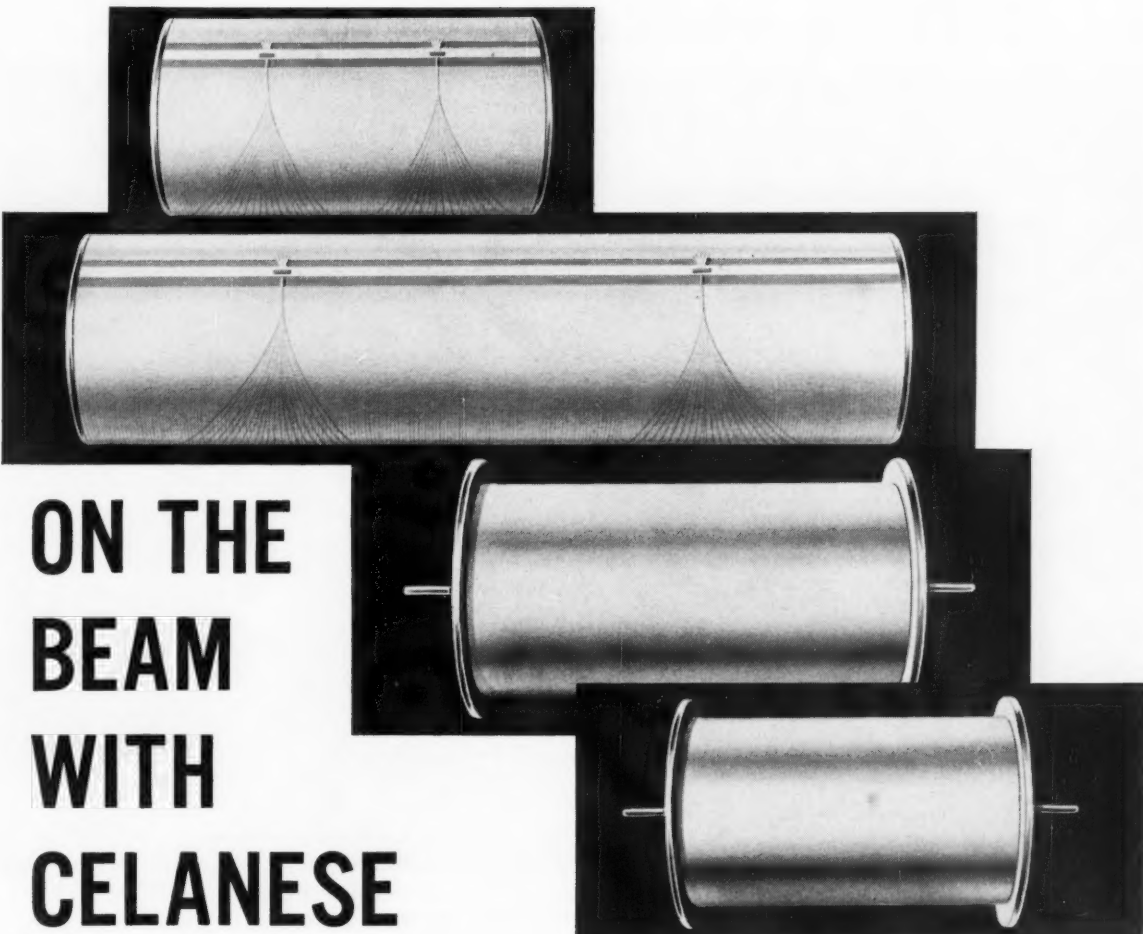
It will pay you to check claims against mill performance before you buy ANY drawing equipment—either as changeovers or new frames. We suggest that you install Ideal Feathertouch Drawing\* and any other make or makes, side by side, and keep comparative records on:

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  3. Drawing sliver strength and evenness
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  6. Versatility
  7. Overall production efficiency
- ... Compare original costs, too

*Ideal Welcomes Mill Comparisons on any basis*

\*Patent Nos. 2,610,363; 2,490,544;  
2,412,357; 2,700,797. Other patents pending.

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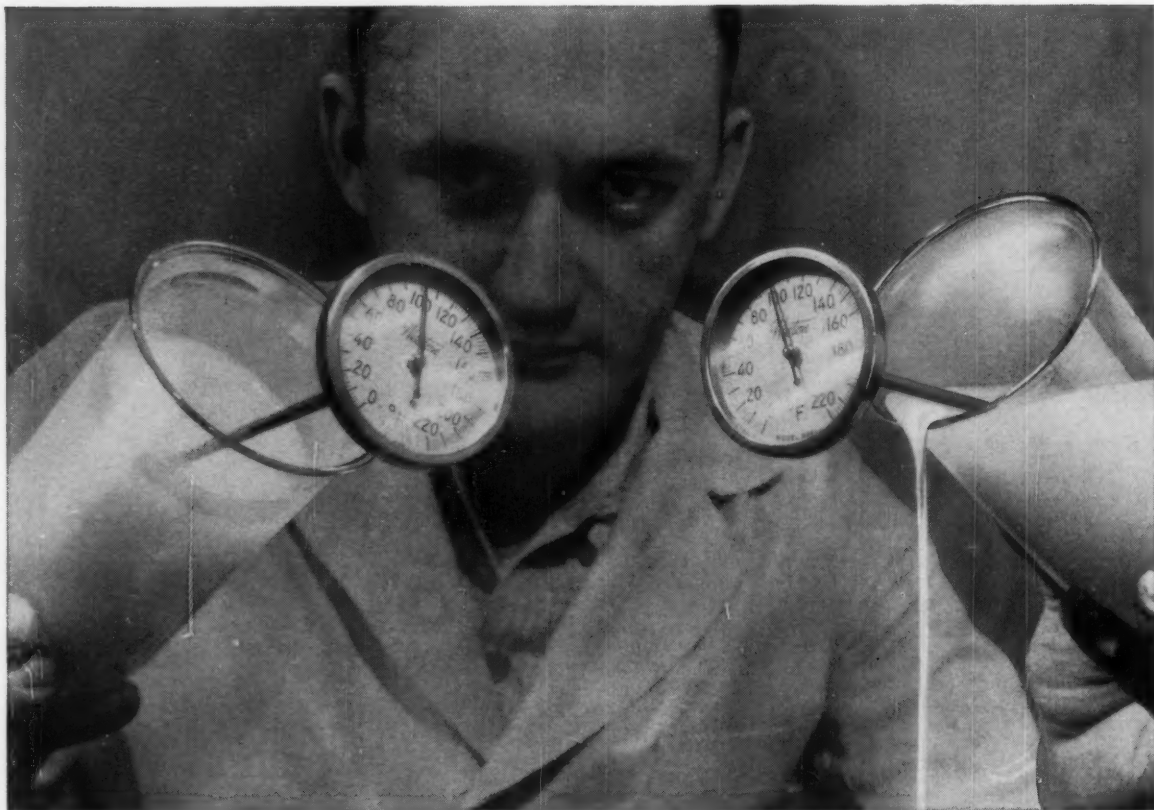
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Chemical & Cellulose Co., Ltd. Montreal

*Celanese*

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Here is a comparison of the viscosity of conventional starch (left) and Ten-O-Film. Note that at 100°F. Ten-O-Film pours from beaker, while conventional starch has congealed.

### For slashing synthetics use **TEN-O-FILM<sup>®</sup>** starches

On blends of synthetic and other fibers, you'll get greatly improved operation with Ten-O-Film Starches.

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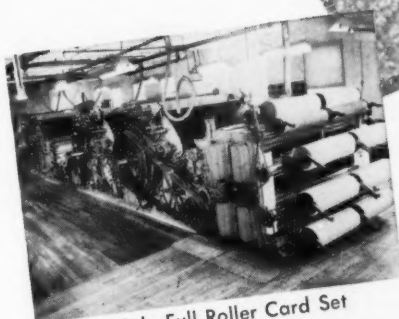
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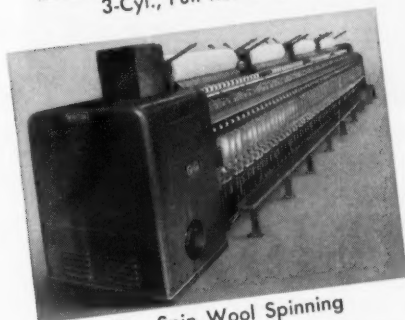




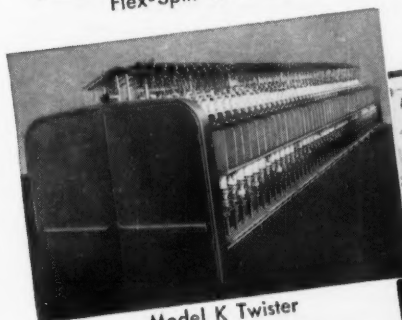
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in YOUR carpets with carpet  
yarns prepared and processed  
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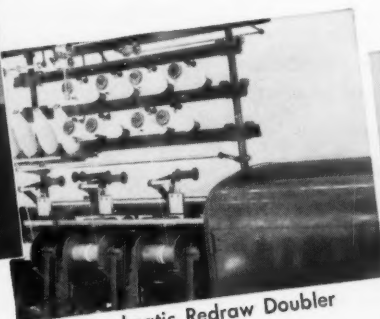
3-Cyl., Full Roller Card Set



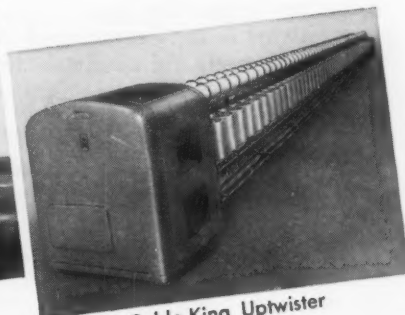
Flex-Spin Wool Spinning



Model K Twister



Spoolmatic Redraw Doubler



Cable-King Uptwister

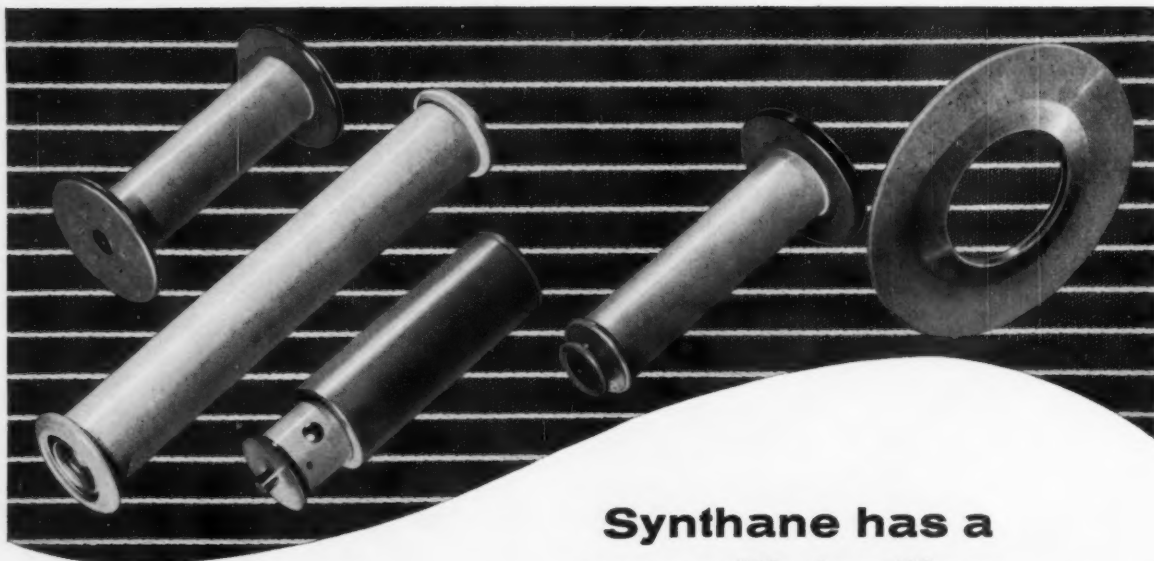
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**September 1957**

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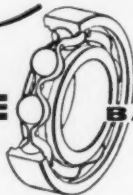
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about

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## **NEW DEPARTURE IN PILLOW BLOCKS**



**GREASE SEALED IN  
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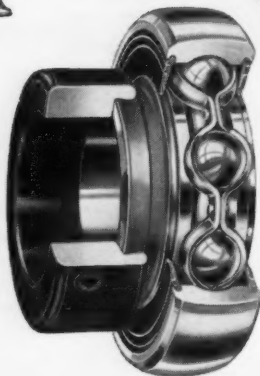
with

**FAMOUS SENTRI-SEAL**

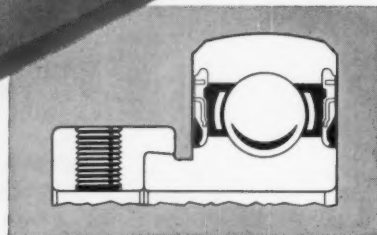
**ON GUARD  
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New Departure Pillow Blocks employ the performance-proved New Departure Type AE Adapter ball bearings with spherical O.D. for alignability and steel-reinforced Senti-Seals for long life protection against dirt or grease leakage.



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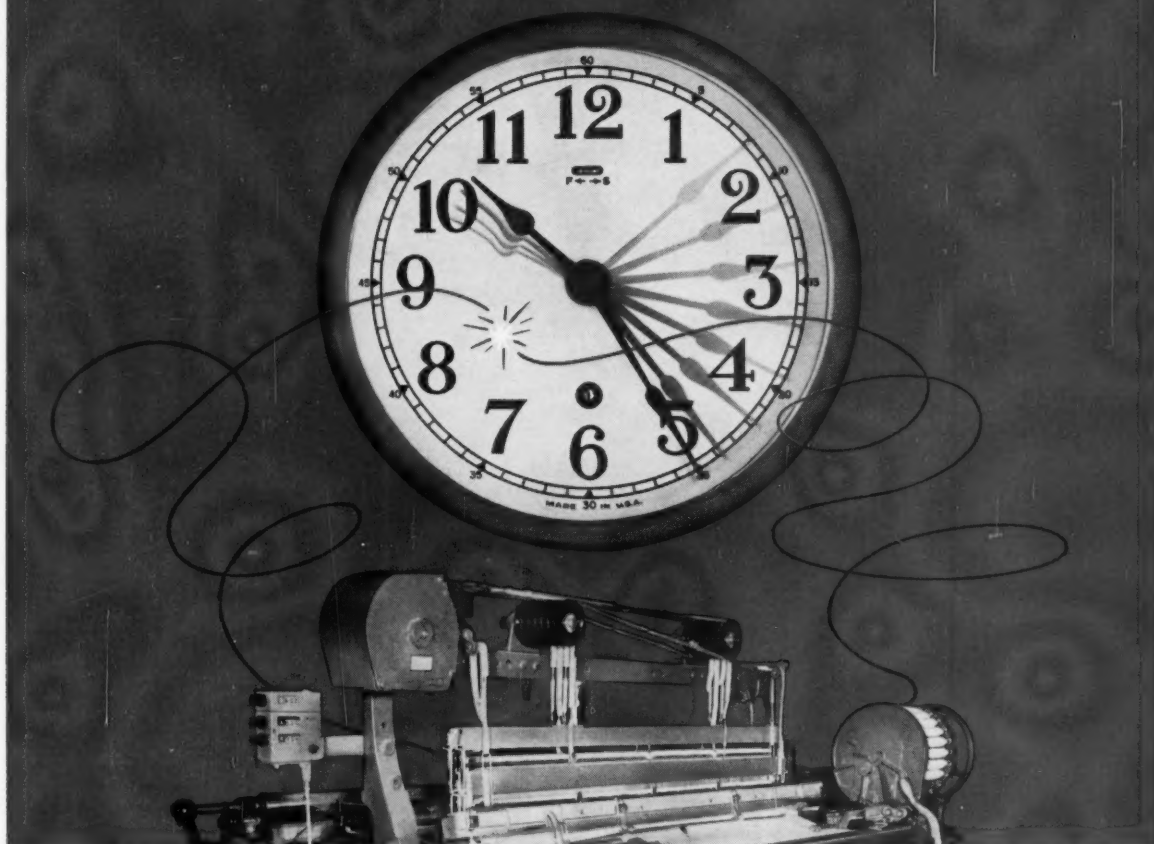


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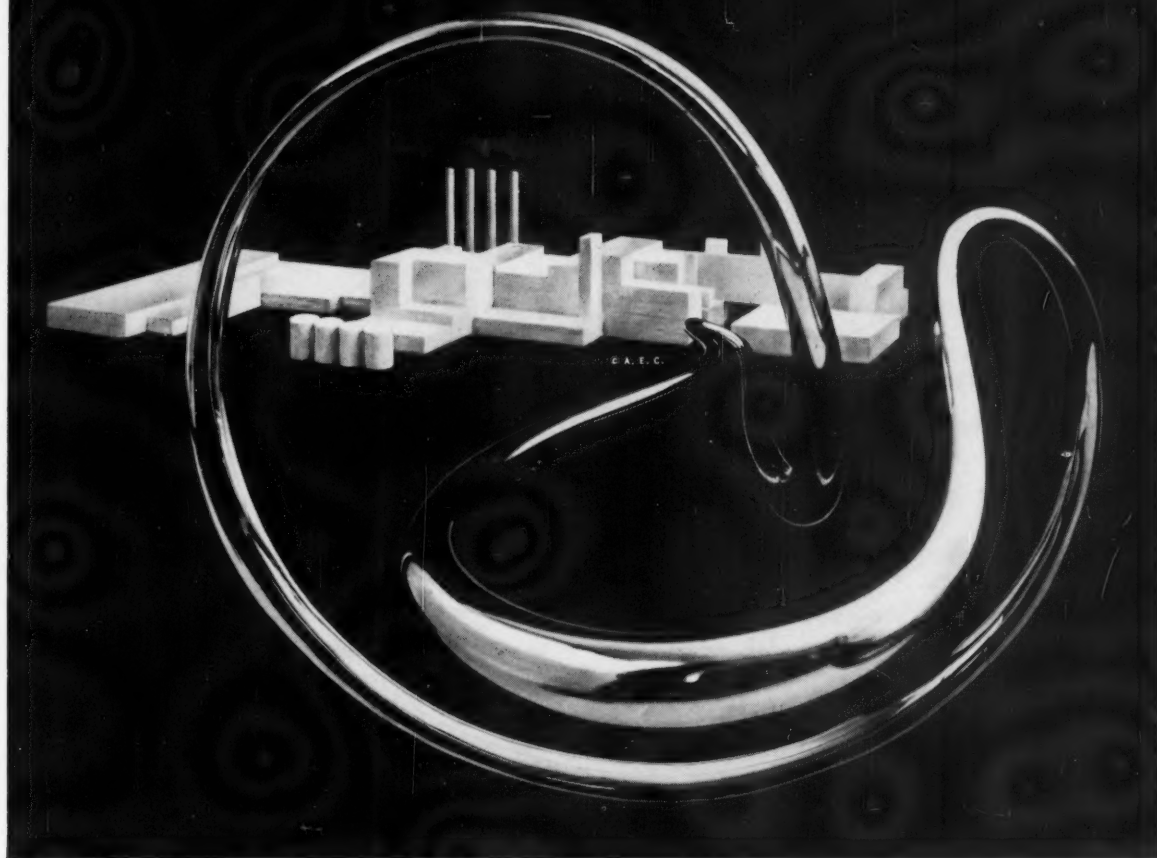
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*fewer leno seconds...  
from dacron warps  
sized with  
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method...*

Dacron filament warp yarns sized and lubricated with Nopcosize\* D-10 and Nopcolube® 55 present an exceptionally flexible, well-lubricated warp. Shedding and flaking during weaving are eliminated.

Nopcosize D-10 in combination with Nopcolube 55 is specially recommended for producing finer Marquisettes with seconds reduced to the absolute minimum.

Add to this the fact that you get a superior split at higher slashing speeds, eliminate top waxing, and produce cleaner greige goods with substantial cost economies, and you begin to see why reports from mills are so enthusiastic.

We'll supply enough for a trial run to prove our point.

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**COATED NYLON**—long-wearing... easy to handle... lightweight  
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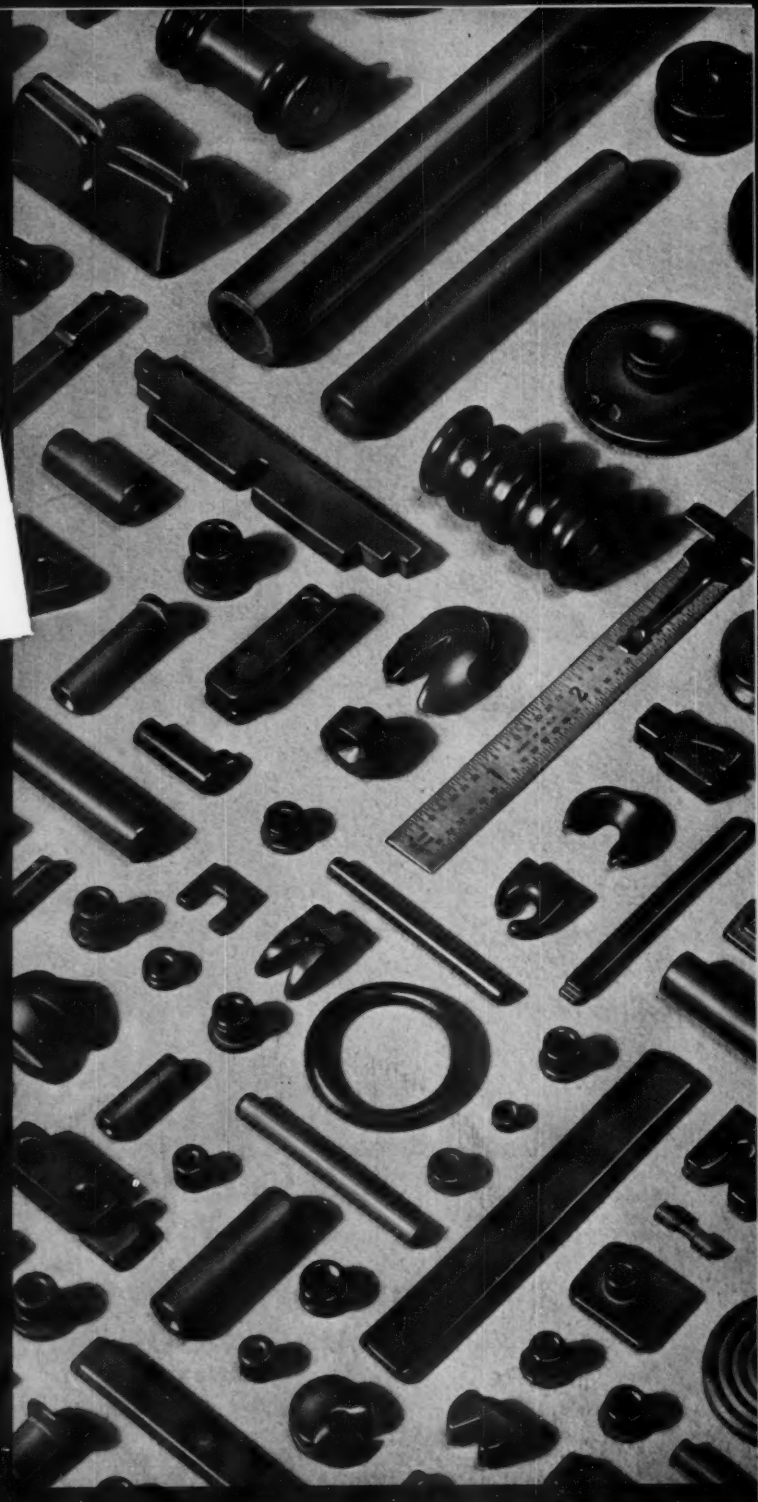
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RECOMMENDED by leading producers of synthetic yarns and by leading manufacturers of textile machinery to assist in the control of static electricity and to produce better quality yarn. Stock designs available for most equipment. Custom made at reasonable cost for special requirements.

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## Publisher's Viewpoint

### The Next Field Isn't Any Greener

We took a little time off recently from our activities in the man-made fibers industry to go over in the next field and visit with our good friends in cotton manufacturing. The fact is that we thought we needed a little change of scene. Everywhere we had been going in the past few months among man-made fiber weavers, knitters and finishers we had been hearing complaints about how bad business is.

And most of the people in the man-made fiber fabric trade who complained about the lagging state of sales often ended up by blaming somebody or something. Sometimes they said it was the fault of the fiber producers in that they didn't do enough promoting; or they said that the producers did too much promoting or the *wrong kind* of promoting. Others said that what was lacking in man-made fiber fabrics was the right kind of styling. Still others blamed slow sales on unreliable performance values of man-made fiber fabrics. What are needed they insisted, are standards and strict observance of standards by mills and finishers.

Many of these complainers ended up by saying that over in the cotton industry they were much more successful because they were doing a better job on promotion, or on styling, or on performance standards. They added that generally speaking, the synthetics group could learn a lot from the cotton people.

So when we were invited to a two-day textile market research conference of the National Cotton Council at the Hotel Statler only two blocks from our office, we hurried over thinking at last we are going to learn at first hand how the cotton fellows manage to do all the things that the people dealing in man-made fiber fabrics say ought to be done, but never get around to doing.

At the conference we heard a lot of outstanding men in their fields discuss the problems of cotton marketing in many interesting and carefully prepared talks. We were mighty impressed by the knowledge and ability and seriousness of these speakers and what they had to say about cotton markets and the ways to sell more cotton goods.

But what do you think? A lot of the ideas we heard sounded familiar. There was talk—good and valuable talk about the need for more market research. There was talk about cotton's loss of established markets to other materials, most of them non-textile materials. And there was talk about the need for more advertising and promotion, about the need for more accurate labeling and better performance standards.

As we listened to all this good talk, it came home to us that the cotton industry was no bed of roses after all. These cotton manufacturers and cotton growers had their problems just like the millmen and yarn producers in the man-made fiber industry. It occurred to us also that, after all, the field next to ours wasn't any greener than our own man-made fibers field—it just *looked* greener from a distance.

At about that time the thought we have often expressed came to us, stronger than ever, that the cotton industry, the man-made fibers industry, and the wool industry are actually cultivating the same field—the boundary line between them just doesn't exist except in our minds. And then it occurred to us that instead of working apart trying each to cultivate one little plot we ought to work together, and plan together, and plow, harrow and seed our field as one big textile market so that we could, in the end, reap a bigger and more profitable crop for all of us.

*A. H. McCallough*

PUBLISHER

# OUTLOOK *IN TEXTILE MARKETING*

By ROBERT C. SHOOK, Textile Economist

## **Trend toward more marketing research held good sign**

The interest of various mill groups in marketing and economic research is a favorable sign. The textile apparel industries as a whole need research at the consumer and marketing level, to keep up with other consumers' goods industries.

Very little is known about buying motives. Consequently, merchandising policies at the retail level have largely relied on price promotions, rather than the promotion of wanted qualities and values.

Furthermore, there is ample evidence that price alone is not the most important consideration. Consumer incomes have increased sharply, with families migrating steadily up the income scale. In departments where styling and quality has been improved, consumers have shown ample willingness to trade up.

**Price Promotions—Habit-forming Drug**—On the other hand, for items which are subject to frequent price promotions, consumers have a tendency to limit their buying to these special events. This is particularly true in the case of staple items. Hosiery provides a current example. Prices are lower now than they were in 1950, but there has been no corresponding rise in unit volume.

An earlier example of a staple item which was sold chiefly on the basis of price is provided by bed sheetings. Recently, with a growing use of color, with fitted sheets, and with nylon (both woven and tricot), results have been much better both from a dollar and a profit viewpoint.

Industrywide marketing and consumer research should lead to better merchandising and distribution. With consumer income high, there is a good opportunity to provide wanted qualities and good styling at prices which will show a much better processing margin.

**Fall Outlook Good**—The textile industry encountered disappointments last fall, and again this spring. The fall pick up last year started off well in September and early October, but following that wholesale volume declined sharply.

One of the most impressive developments, however, was the extent of curtailment by mills. Cutters also have followed a conservative policy, both in fabric buying and in production.

Meanwhile, retail sales have continued on a favorable basis. Most textile apparel departments have shown sales gains for the year to date, which are equal to or exceed any increase in prices as compared with a year ago. The inventory position at the retail level is therefore very liquid, with some delivery difficulties being encountered for seasonal merchandise.

**Prices Are Firming Now**—Fall 1957 results will naturally depend somewhat on the weather. A warm spell late in the fall will hurt heavy outerwear, as it did in 1956. On the other hand, selling weather could hardly be worse than it was last year, and the inventory position of the industry will be much stronger.

Meanwhile, fabric prices, although not showing a large operating margin, have responded to mill curtailment and favorable retail sales by showing overall firmness with moderate increases. The industry appears more determined than in the past to control production so that excessive fabric price weakness can be avoided. As marketing and consumer research programs bear fruit, this industry should begin to compare more favorably with others from the profit viewpoint.

(Continued on Page 61)

Dr. Shook, vice president and research director, A. W. Zelomek Associates, Inc., 350 Fifth Ave., New York City.



# He stayed with silk

Fifty-nine years ago Edwin Stoeckel got a job in a silk mill. He has been happy at his work ever since. And he has learned all the skills of silk manufacturing with a mastery few men in the United States can equal

**By Jerome Campbell**  
Editor, MODERN TEXTILES MAGAZINE

**W**HY WOULD YOU WANT to write a piece about us?" Edwin J. Stoeckel, president of Black Diamond Silk Co., asked when we told him we would like to write his story for MODERN TEXTILES MAGAZINE.

"We're only a tiny old-fashioned silk mill with 150 looms, and most of your articles are about big companies. And I don't think that anyone could honestly say that we've been successful." Smiling broadly, he added: "Nobody ever got rich working for the Black Diamond Silk Co. The only thing that can be said for our credit is that we've been in business for half a century and during all those years we've given employment to 150 people or so here in Scranton."

We pointed out to Stoeckel that he had summed up neatly our reasons for wanting to write the story of his long career with Black Diamond. To have survived more than 50 years in the silk weaving business and to have provided steady employment for 150 people during all that time, was, in our opinion, something to be proud of. It was worth writing about, we told him, and we added that we were sure our readers would think his story worth reading.

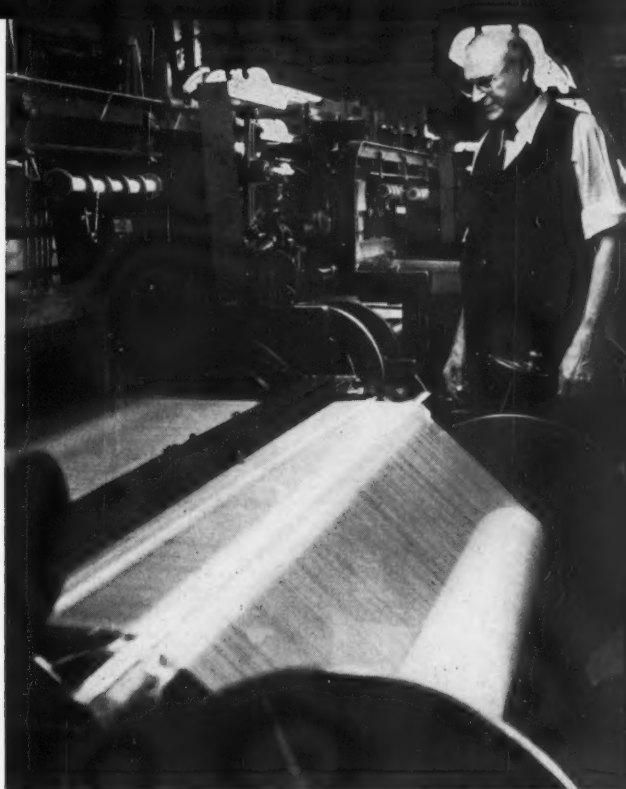


Photo by the Editor

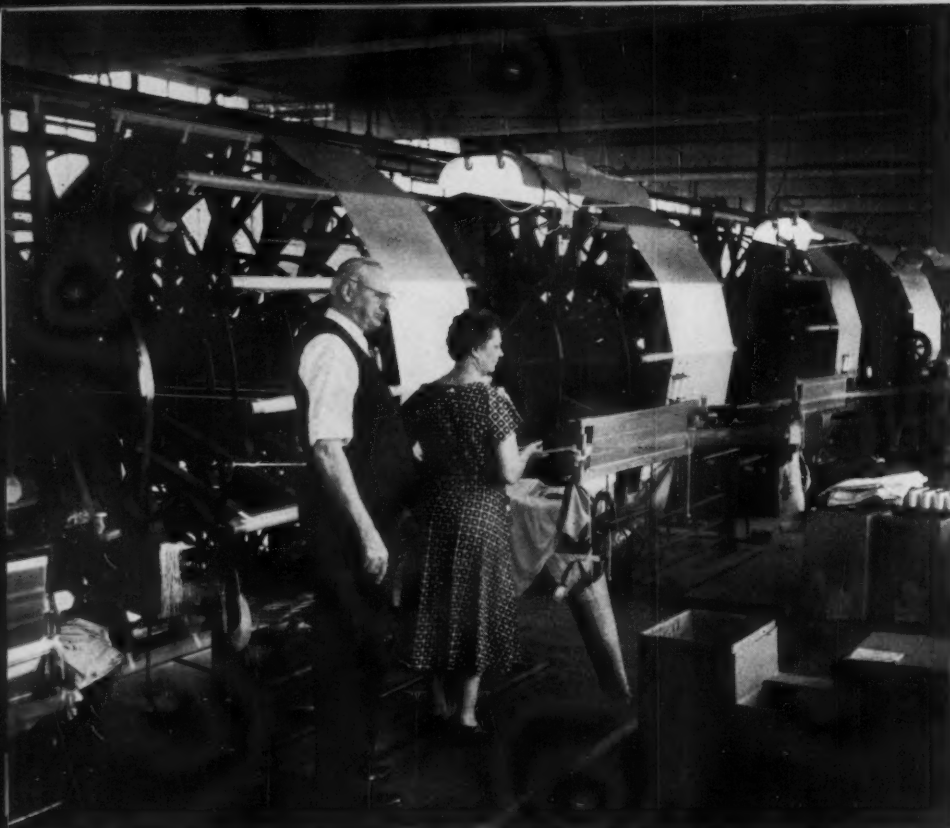
**THE EYE OF EXPERIENCE**—Edwin Stoeckel pauses on one of his frequent tours through his mill to note if the tension of this all-silk warp is right for weaving cloth free from defects.

The fact of the matter is that Edwin J. Stoeckel, in his utterly unpretentious way, is a remarkable man. In him and in others like him are stored the skill in making fabrics that is the heart of the textile industry. Without the Stoeckels, the men who really *know how* to make fabrics, the men who gained their deep knowledge of yarn preparation and weaving by decades piled on decades of practical experience derived from long hours every day of painstaking labor, the textile industry would be hard put to survive.

Silk is the fiber that Edwin J. Stoeckel has worked with for 59 years. But there are other men like him in cotton, in synthetics and in wool—not many, of course, but still enough of them to pass their invaluable skills along to younger men. And it is important for the textile industry to see that there are always men like Edwin Stoeckel working at their trade of making fabrics and accumulating in their work the traditional skills of the fabric technician and master of yarn and fabric production. When such men are no longer available, the textile industry will be in jeopardy despite all its high-speed equipment, new fibers, and expensive promotional programs.

At the age of 73, still cheerful and energetic, still coming to the mill every morning to do a good day's work, Stoeckel has the great satisfaction of seeing a brisk revival in demand for the silk fabrics he loves. Right now Black Diamond's 150 looms are running six days a week on two shifts weaving chiffons, crepes and organzas of all silk to meet the current demand for these fabrics in the fashion industry.

"It's been 15 years since we produced chiffons in this mill," Stoeckel says with his easy cheerful smile. "And now they are back in demand again. It's a good thing we have plenty of old-time silk workers on our payroll here, or it would be tough to get these soft silk constructions out again."



**BACK WHERE HE STARTED—**  
In the half century that has elapsed since Edwin Stoeckel went to work in a silk warping department, methods of making silk warps have changed little. Here Stoeckel pauses to have his picture taken in Black Diamond's warping room

Photo by the Editor

Walking through the mill, he introduces us to some of these old-timers. There's Augusta Dobrindt, a warper who has been with Black Diamond 47 years. There's Mary Hughes who has been in the throwing department for 50 years, and Catherine Higgins with Black Diamond for 40 years. Then there's Edwin Saar, the superintendent of weaving, who has worked for the company 51 years, and Carl Luft in charge of throwing who has been with Black Diamond 29 years.

"Our older workers," Stoeckel points out, "are good steady workers." Without their skill Black Diamond would have found it hard to get back to all-silk fabrics after an enforced period of synthetic weaving during World War II. Chuckling over the strange turns that fashion takes, Stoeckel points out that right now the mill has returned to weaving the kind of fabrics that were popular 40 years ago.

Edwin Stoeckel got into silk manufacturing because of a mother's concern for the welfare of her son. Born and raised in Scranton, Stoeckel, when he was 13, went to work in an iron foundry. But his anxious mother thought the work too strenuous for the limited strength of one so young; after he had toiled for 18 months in the foundry, she sent him to look for a job in a silk mill where she believed the work would be lighter than his days in the sooty atmosphere of iron casting. Stoeckel found work with Reiling, David & Schoen, a company which had a mill in Scranton as well as other mills in West New York, and Hoboken, N. J. and Valley Forge, Pa. Reiling made the "most beautiful silks in America" Stoeckel recalls a little wistfully as his mind goes back to those great early days of American silk manufacture.

The decision to leave the iron foundry and work in a silk mill was, as it turned out, one of those fortunate ones that happen in the lives of most of us—if

we are lucky. Although he was scarcely more than a child at the time, Stoeckel's entry into the atmosphere of textiles meant that he had found his life's work. For it so happened that young Edwin Stoeckel had in him a strong affinity for fabrics, a deep undeveloped talent for all the skills and aptitudes that go to make the born fabric technician and master of silk manufacture.

In short, Edwin Stoeckel at less than 15 years of age took to silk manufacture like a duck takes to water. And the happiness and satisfaction he found in making silk yarns and fabrics has remained with him for a long lifetime: today at 73 he is a serenely cheerful, pleasantly busy man, held in enormous esteem by all who know him in the trade, and revered by his fellow workers in the Black Diamond mill.

After working and learning diligently for two years in Reiling's warping department, young Stoeckel ambitiously sought a post with a new silk mill being set up in Scranton. This was the Morrison Silk Co. which hired Stoeckel to be foreman of the warping room at \$10 a week—grand wages for the year 1902. In return for this handsome sum, the working hours were a little long by today's standards. Stoeckel was at the mill every morning at seven and he worked until six at night with an hour for lunch. Saturday was a half day—7 a.m. until 12 noon.

Stoeckel thus learned about silk manufacturing by working at it aided by that imponderable element of exceptional aptitude for textiles. To the practical skills of throwing, warping and weaving, he added over the years great skill and experience as a fabric technician. He learned how to analyze fabrics and yarns, and how to plot a "picture" of the weave. His only formal training in these and other textile skills he acquired from courses in the International Cor-

(Continued on Page 48)

# How to spin worsted yarns of Dacron-Wool

A Du Pont expert here provides millmen with tried and tested guidance for making these popular yarns

By J. A. Newnam  
THE DU PONT CO.

ONE OUT OF EVERY TWO men's summer weight worsted suits sold this year will contain a substantial percentage of Du Pont's Dacron® polyester fiber. The blend of 55% Dacron and 45% wool has become a staple item in the textile market. The wide public acceptance and the ease of processing this blend have led to its growing popularity. Spinning costs and fabric seconds with this blend, in many mills, are lower than for 100% worsteds. Mills are taking advantage of the higher yarn strength of the blend for greater flexibility in processing. Higher processing speeds, finer counts, and tighter woven constructions, without a sacrifice in processing efficiency, make a blend of 55% Dacron and 45% wool one of the most popular newcomers to the market.

Blends of Dacron and wool have been produced on all types of spinning systems. Cut wools have been used on the systems that normally employ shorter staple lengths. However, the major part of the work has been done on the longer staple systems, with the top being made either through the worsted card or Pacific converter route. The Dacron polyester fiber staple lengths usually employed are two-and-one-half, three, or four-and-one-half inches on the card, while a three- or three-and-one-half-inch variable staple length has been most popular on the Pacific converter. The staple deniers selected may be 3.0, 4.5, or 6.0 or a combination of these, depending upon the body and crispness desired in the final fabric. Counts up to 1/60 w.c. from a blend of 55% Dacron polyester fiber and 45% wool employing 3.0-denier Dacron have been spun with ease from natural, stock-dyed, or top-dyed fiber.

The systems for spinning man-made fibers have been developed along with the fibers. Machines with improved efficiency, better precision, and greater productivity are leading to fewer steps in processing and reduced spinning costs. For instance, a typical system for processing Dacron into a blend of Dacron and wool, after carding or converting the Dacron into a sliver, might be:

- Two to three gillings
- Blending with wool top (gill)
- Combing (optional) (two gillings)
- Three pin draftings
- Roving
- Spinning.

## Importance of Tinting

There are several factors or processing techniques that should be taken into consideration in processing of Dacron and wool.

Tinting deserves careful consideration. As with 100% worsteds, improper application—as regards

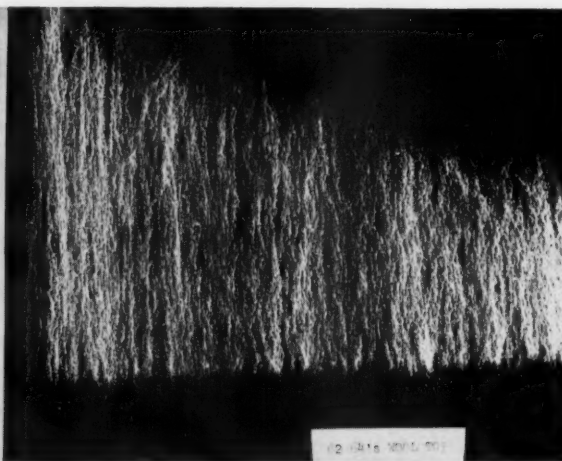
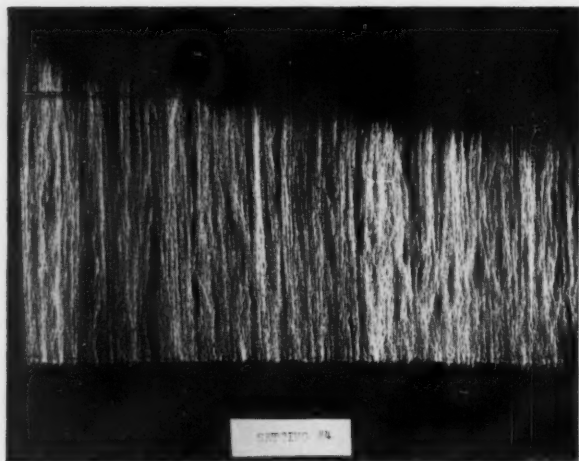
type of tint, amount, or dispersant—can result in poor fugitivity, roll lapping, poor drafting, or poor yarn quality. Many of the tints successfully used on wool have been found acceptable for blends of Dacron and wool. Each tint should be carefully checked for its effect on fiber drafting characteristics and for its fugitivity. Fugitivity should be checked after either twist setting or slashing. An even application has been found essential even with fugitive tints to avoid adverse effects of processing. Spray or roller application fed by a positive delivery metering device has proven very satisfactory.

Throughout the process, the day-to-day temperature and relative humidity should be maintained as steady as practical. Temperatures between 70 and 80 degrees F. and relative humidities from 50 to 60% have, generally, been satisfactory; however, if a tint and dispersant application have been adjusted for a given set of conditions, minor corrections in the amount of dispersant may be desirable for seasonal changes in temperature and humidity in order to maintain yarn quality. It is generally advisable to condition the stock at the desired temperature and humidity level for several hours before attempting to process. Also, in cool weather, after a week-end shut-down, the mill should be brought up to the desirable humidity and temperature for several hours before start-up.

One of the most important considerations that cannot be entirely divorced from tints or temperature and humidity is tension on the fiber or yarn during processing and handling. Evenness of tension on blends of Dacron polyester fiber and wool is more important in handling the blend than in handling either of the fibers in 100% form. If the blended yarn has been put under excessive tension, the Dacron and the wool fibers have different relaxation characteristics. This would not be as detrimental to either component in 100% form as it is to the blend. Tensioning the blended yarn causes yarn stretch which may not recover until the fabric is treated in a hot-wet finishing operation. Therefore, yarns that have variations in tension in processing or handling may give variable shrinkage in the individual yarns in the finished fabric. This can be a source of tight picks, tight ends, filling bands, warp streaks, or tight selvages. By being aware of this consideration, it is relatively easy to avoid any difficulty that might arise from this yarn property. Operator training to avoid variation in tension on the yarn has eliminated this potential problem whenever it has been encountered.

Careful attention to the heat history of the fiber, yarn, or fabric prior to dyeing is important. Temperatures in the range of 275 to 400 degrees F. cause a





**LOOK ALIKES**—Variable cutting attachment on the Pacific Converter, with proper feed, gives a staple diagram (left) approaching a normal 62-64's wool top diagram (right). This aids in producing a more uniformly blended yarn.

reduction in the dye receptivity of Dacron polyester fiber while temperatures above 400 degrees F. generally cause an increase in dye receptivity. Temperatures above 180 degrees F. often set the tint or oil in the fiber. For this reason, it is essential that all yarns going into a fabric have, within reason, the same history. It is equally important also, that undyed fabric, receiving heat treatments, should receive the same heat history throughout the fabric. The main sources of variable heat history are twist setting, slashing, and heat setting the fabric. Careful attention should be given to establish uniform cycles for these or other operations where heat is involved.

After top dyeing, three of the keys for good processing and for good yarn quality are the complete removal of excess dye particles in the rinsing operation, proper drying, and the correct application of a good lubricating or antistatic agent to the stock. Excessive dye particles on the surface of the individual fibers cause poor drafting. Inadequate drying can lead to uneven drafting. Improper finish usually leads to tackiness, static, or poor fiber drafting. Antistatic lubricating agents added after top dyeing should be applied with a positive displacement metering pump to insure as even application as possible. In most instances, the finish has been successfully metered on the sliver during backwashing just prior to the final squeeze rolls. Application at this point permits the squeeze roll to disperse the finish throughout the sliver. About 0.6 to 0.8% total finish of such agents as Nopco LV-40, Fyrol 1000, or Nopco-stat 2152P has proved satisfactory.

#### **Building Pill Resistance**

One of the most important over-all considerations in producing a good functional fabric of Dacron polyester fiber and wool is building pill resistance into the fabric. Satisfactory pill resistant fabrics are being produced readily with the currently known techniques. Good fabrics of Dacron and wool usually have tightly woven constructions with high yarn twists (about 20% higher than the 100% wool counterpart) and proper finishing.

Since there is no set rule that applies to all fabrics, the adopted procedure for the development of a new fabric is to use all of the known principles which inhibit pilling in producing the fabric and then wear-

test the fabric in the end use for which it is intended. Laboratory pill tests can give an indication of the pilling tendencies of a fabric; however, there is no known laboratory test that will give complete correlation with wear in all end uses. Wear-testing of garments during the development of a fabric is extremely important.

#### **Processing**

Dacron staple is usually carded at 30 to 40 pounds per hour on single cylinder cards. The most successful results have been obtained on synthetic cards employing metallic clothing. Fillet wire has been successfully used, although the processing is somewhat more critical than on metallic clothing. Settings normally used for 64's to 70's wool have been found generally satisfactory. The main points to observe in carding are the openness of the stock at the web.

Chips of fibers in the web indicate insufficient working of the stock to separate the fibers while nibs indicate overworking of the stock. The latter usually accompanies card loading. The presence of chips in the web indicates the need for closer settings while nibs (if the stock is virgin, untreated) usually indicate a need for more open settings.

Currently, the Pacific converter is being used more extensively for processing Du Pont's Dacron polyester fiber than is the worsted card. The converter normally is fed by four ends of tow (450M) giving a total feed of 1,800,000 denier. Production rates of 100 to 125 pounds of 175 to 200 grain sliver are reasonable. There are several important points to bear in mind in producing a good sliver of Dacron with the desired staple diagram. Each tow end must be fed to the feed section in a flat ribbon, untwisted, with uniform tension. The flat ribbon aids in getting complete cutting, while untwisted, uniform tension is necessary in order to obtain the controlled staple length.

Most spinners are employing the variable cut attachment to the converter to give a three- or a three-and-one-half-inch average variable length. The variable length of Dacron staple has been shown to match more nearly the staple diagram of the wool which allows the spinner to produce a more uniform blend of Dacron and wool with fewer blending steps

(Continued on Page 39)



# *How much dye created all this color?*

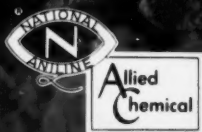


Just teaspoonfuls! But a trick of double exposure makes them appear as huge mounds.

It isn't always that simple, but National Aniline has been turning tricks with color for eighty years.

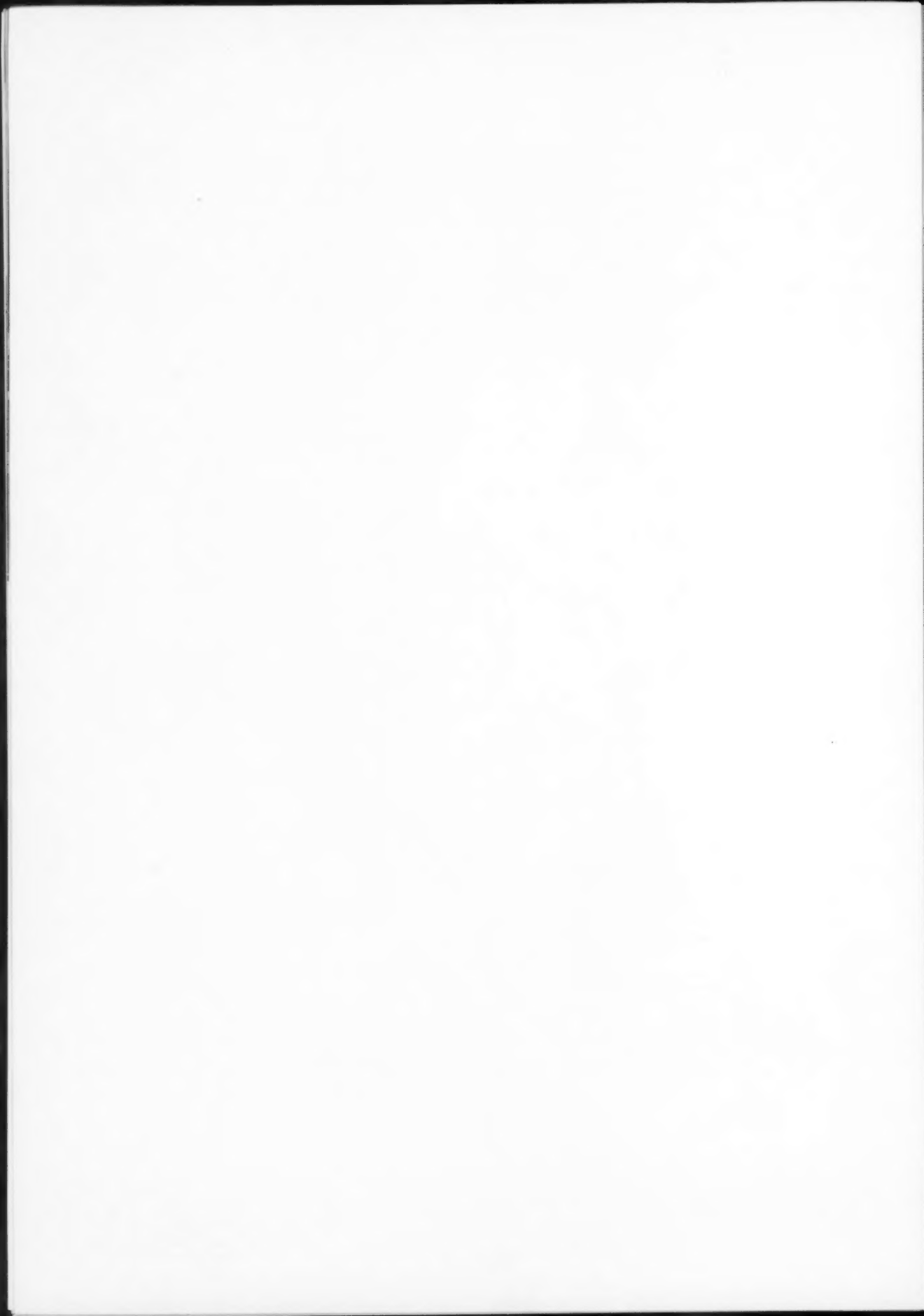
We continually develop new dyes and application techniques. Our Color Standardization Control Laboratory rigidly maintains high standards of quality and uniformity. And with our amply-staffed Application Service Laboratories coast-to-coast we render exceptional technical service.

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## Dacron-Wool

(Continued from Page 36)

in the spinning operation. The curved bar creel is excellent for use in feeding the tow properly to the converter. In the converter operation, another key point is the proper adjustment of the shuffle section to break up any clusters of fibers. Clusters formed by the cutter section are more easily broken up on the converter than at any other point in the spinning system. The proper adjustment of the shuffle section is usually made by the appearance of the web; using a tighter adjustment (thicker shims) helps to break up clusters.

Many spinners have found it desirable to add additional lubricating oil at the crimper of the converter in order to give better drafting characteristics to the blend in subsequent operations. To the undyed natural fiber, about 0.4 to 0.6% lubricant, metered at the crimper, has been found helpful.

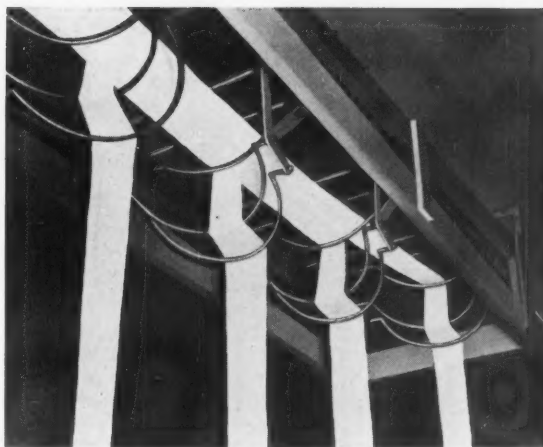
Two to three gillings are normally required to parallelize the Dacron polyester fibers and improve the sliver uniformity before blending. This is a normal practice for both the carded and converted sliver. Like other gilling operations, the pinning is coarse to fine in going to the successive operations. The generally accepted faller pinning for the first operation is eight to 11 pins per inch using drafts of four to five. Attempts at using finer pinning and higher drafts may result in either damage to the fiber or to the fallers themselves. In the finisher gilling prior to blending, the pinning is usually increased to 15 to 17 pins per inch. A normal load for the finisher gill may be 1500 to 1600 grains with a draft of about six to give a 250 to 260 grain sliver for blending with the wool.

The Dacron and wool are usually blended in the third or fourth gilling operation. The combed wool top and the gilled sliver of Dacron are most generally fed in proportions to give a blend containing at least 55% Dacron. It is important at this point to have a close routine check of the sliver weights not only to control the over-all sliver delivery weight but also to avoid problems in fabric dyeing later, particularly with cross-dyed fabrics. In general, depending on the dye and color, a variation of 2% in blend composition gives junctions that are visible to the eye in cross dyed fabrics.

The necessity for combing the Dacron polyester fiber or combing the blend is determined by the nib counts in the gilled sliver of Dacron or in the blend. If combing is desirable, it is usually more economical to comb the Dacron separately before blending. The end use requirements will dictate the need for combing. Generally, when a good job is done in sliver preparation, there is little need for combing of the Dacron or blend particularly for union-dyed fabrics. If combing of the Dacron is desirable, better results are usually obtained on the French-type comb. Noble combs have been used but some trouble has been encountered in adapting the low denier Dacron to the feed motion of the circular comb. The noil seldom exceeds 2% for 100% Dacron and 4% for the blend.

Two gillings should be sufficient to return the combed sliver to an acceptable evenness.

Normally, three pin draftings are needed to reduce the gilled sliver to a suitable weight for roving. The draft may progress from six to 10 with faller pins increasing from 15 to 22. Standard operating efficiencies can be expected.



**HOW TO FEED A CONVERTER**—The curved bar creel, developed by Du Pont, gives excellent feed control to the Pacific Converter. Curved bars for each individual tow end, mounted high over the tow box, aid in smoothing the bundle, removing twist and properly tensioning the bundle. All tow ends enter the cutting section of the converter under even tension.

Finisher pin drafter sliver can be processed into roving on either the newer long-draft equipment or the conventional Bradford and French worsted roving machinery. Satisfactory roving has been produced on the long-draft frames with drafts up to 20. Roving from blends of Dacron and wool generally requires less twist than is needed for all-wool roving of the same hank. The twist should be as low as practical. Slight increases in productivity can be realized from this lower twist requirement. The use of clearers on all apron surfaces is advisable.

Normal spinning procedures are used with blends of Dacron polyester fiber and wool. Drafts as high as 15 are not unusual. The increased yarn strength resulting from the presence of Dacron will allow an increase in spinning speeds, but traveler weights must be adjusted to prevent excessive tension and resultant tight packages.

Since spun yarn twist is an important factor in the pilling tendencies of finished fabrics, a worsted spinning twist multiplier of 3.0 is considered the minimum for satisfactory pilling resistance. Pilling tests should be completed on finished fabrics before spinning twists are approved.

Single and ply yarn liveliness can be controlled by twist-setting the yarns under high temperature and humidity. Where practical, the yarn should be conditioned on spinning tubes or twister bobbins in order to eliminate "kinking" during subsequent winding operations. While the actual time required may vary with package size, package density, yarn count, and yarn twist, the yarn liveliness should be under control after conditioning for one hour at temperatures of 180 degrees F. dry bulb and 170 degrees F. wet bulb. At no time should temperatures above 180 degrees F. dry bulb be used because of the possibility of setting the tint and oil in the fiber. Conditioned yarns should cool for a minimum of four hours before further processing. Within mill lots, close adherence to twist-setting temperatures and times is mandatory, particularly with tinted yarns.

### Summary

Blends of 55% Dacron with 45% wool are continuing to gain in popularity. Much progress has been made during the past few months in developing the Dacron fiber and in developing techniques for processing the blend. Today, spinning and weaving costs of these blends in many mills are lower than the cor-



**PILLING CAN BE AVOIDED**—Pill control should be built into the fabric through high twist, tight constructions and proper fabric finishing. Improperly made fabrics, as the one on the left above, become pilled objectionably upon use while a properly made fabric (right) will withstand normal wear without serious pilling.

responding cost for 100% worsteds. This has been achieved largely by the proper selection of raw materials and machines, by establishing uniformity in routine operations in the mill and by being alert to control those factors which alter the uniformity of the product during processing.

Some of the important factors to be considered in preparation of fabrics of 55% Du Pont Dacron polyester fiber and 45% wool are:

1. Select Dacron staple of proper length and denier for satisfactory processing and end use.

2. Select tints and dispersants carefully and apply evenly.
3. Maintain uniform heat history on all yarns and undyed fabrics.
4. Maintain uniform tensions on all yarns.
5. For top dyeing—remove all residual dyes, dry, and apply antistatic lubricating oil evenly.
6. Maintain machinery in good repair.
7. Control humidity and temperature as closely as practical.
8. Build pill resistance into the fabric.

## Non-Fabric Textiles Shown

"Life-saving" suits, now being experimentally developed in the Navy laboratories in Brooklyn, N. Y., were recently displayed at an all-day conference on non-fabric textile materials at the Polytechnic Institute of Brooklyn. The various protective suits were made of new plastic films, expanded plastic foam, non-woven textiles, paper for decontamination work, and combinations of films and textiles.

J. J. Press, of the Institute and the Research & Development Division of the U. S. Navy Clothing and Textile Office, said that the possibilities in these new methods of creating man-made materials from a test tube may eventually contribute as much to the textiles of the future as man-made fibers are contributing today.



## New Tire Cord Plant

The B. F. Goodrich Co. has purchased 20 acres of land in Exeter Borough, Luzerne County, Pennsylvania, for the site of its new textile processing plant. Construction of the plant will get under way shortly, with manufacturing operations scheduled to begin in 1958. Rayon and nylon tire cord used in tire construction in the company's five tire plants will be processed in the new facility. Textile operations of the company conducted for over 10 years in a leased building in Wilkes-Barre, Pa., will be transferred to the new plant when it is completed.

## Power-Driven Shuttles

Dr. Worth Wade, manager of patent development for American Viscose Corp., has announced that licenses will be offered under basic patents on power-driven shuttle mechanisms for looms. One of the patents, No. 2,784,743, issued March 12, has the shuttle of a loom driven by means of a fluid propellant such as liquid or gas.

In an earlier patent, No. 2,682,895, the shuttle is driven by solid explosive charges fed to the shuttle propulsion unit by use of a paper tape. A third invention now pending relates to time-delay mechanism for the power-driven shuttles.

Use of power-driven shuttles is expected to eliminate about 35 moving parts on present looms, reduce the vibration and greatly increase the speed of the loom. Dr. Wade reports the new shuttle can be incorporated in new looms or in existing looms of which there are about 500,000 in use today, according to the U. S. Census Bureau.

Lionel Weinstock (left) and Jack J. Press of the U. S. Navy Clothing & Textile Office demonstrate the removable liner from a cold weather and flotation jacket.



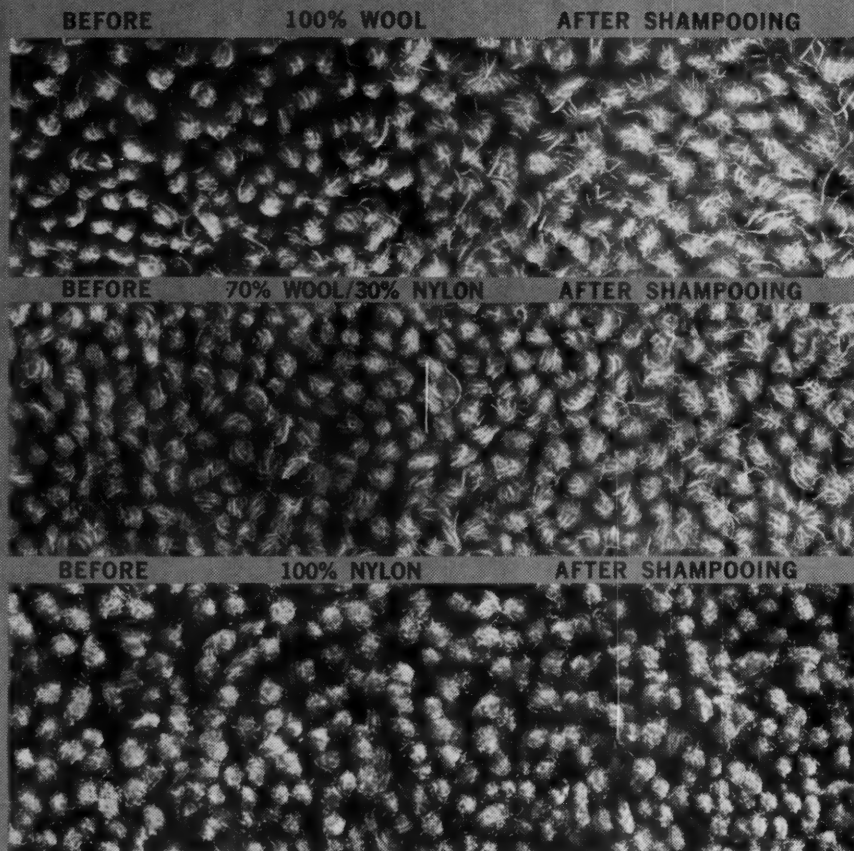
# **In carpeting, nothing adds all-around performance like NYLON**

- How does nylon carpeting compare with wool? That's the question we have been asked most often by floor covering manufacturers, retailers—and consumers.
- Here, to our knowledge, is the first definitive answer on four of the most important counts: Wear, permanent texture, recovery from crush, and luster.
- It took many, many months to complete these actual in-use and laboratory tests. We'll be delighted to explain them in detail. And reprints are yours for the asking—



## permanent texture

Photos show identical\* strips of carpeting before and after shampooing 10 times with rotary brush action. 100% wool has lost considerable texture. The addition of 30% nylon produces a fabric which stands up remarkably well, but not as well as 100% nylon which shows virtually no texture loss.



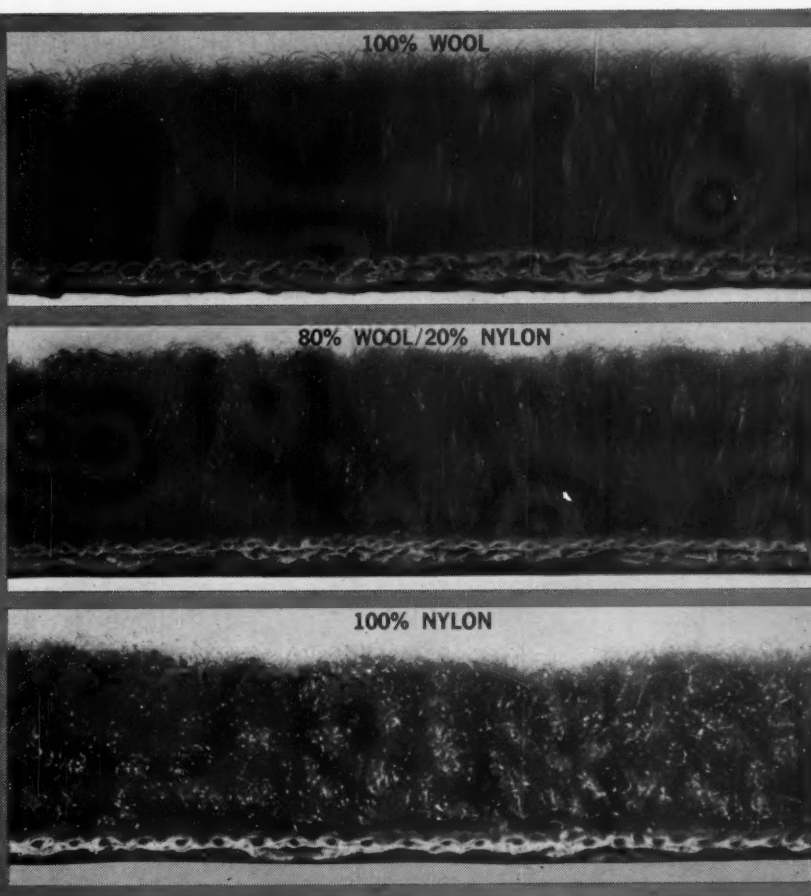
## wear...

Nylon outwears wool and every other carpeting fiber known. In this test, identical\*, unpadded strips of carpeting were laid on bare, rough steps in an industrial plant. Strips were rotated regularly. 100% wool broke down at 31,500 pedestrian traffic mark. 80% wool/20% nylon was still useable after 98,000 pedestrians. At same 98,000 mark, 100% nylon shows virtually no wear.

## luster

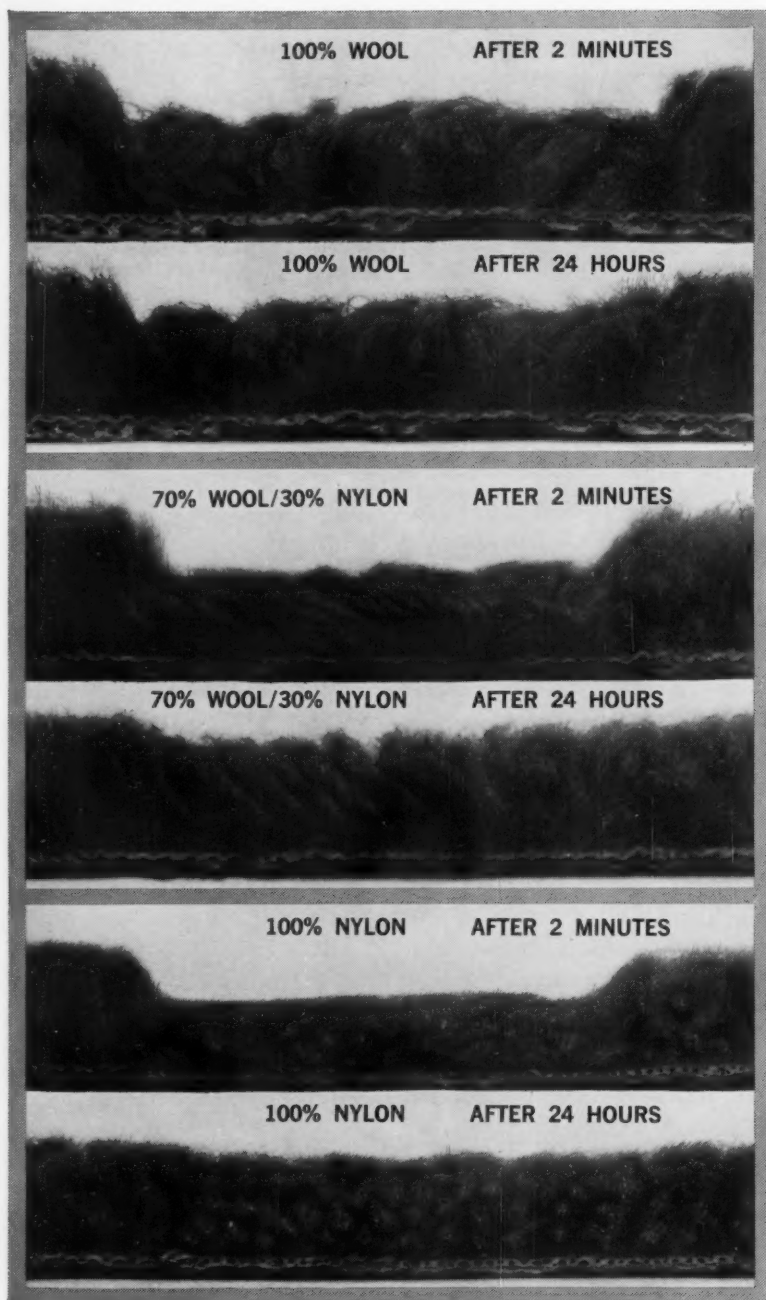
The luster of nylon is well known. Manufacturers of better wool carpeting have for some time been adding nylon to get additional sparkle. Shown here are the relative degrees of luster of 100% wool, an 80% wool/20% nylon blend, and 100% nylon\*

For this test, as in all others, identical\* fabrics were used. But in order to get a color which would photograph properly against a white background, the carpet samples were re-dyed. Note that, as a result, the wool sample has lost almost all twist while the 100% nylon has lost virtually none.



I·R·C

more tests



## recovery from crush

Identical\* carpets were subjected to a concentrated weight of 25 pounds per square inch pressure for 24 hours. This is comparable to the weight of a *standard sofa*. Photos were taken 2 minutes after removal of load and again 24 hours later. Although wool starts recovery more quickly, it does not come back completely after a full day. 70% wool/30% nylon blend and 100% nylon recover more slowly but more completely.

\*Within each test, strips of carpeting were identical except for fiber content.



# I.R.C.

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## REPORT FROM EUROPE



BY SPECIAL CORRESPONDENT

### **Man-made fiber producers study ways to fit Their activities into future "common market"**

PARIS—Man-made fiber manufacturers, who have a big stake in pending European "Common Market," will set up a special subcommittee early this month to work within the framework of the International Rayon and Synthetic Fibers Committee. IRSFC is about to hold its annual meeting here, and the impact of the "Common Market," slated to start in 1958, will be taken up.

Big problem facing Europe's man-made fiber men is how the various cost disparities that exist among them can be narrowed so that no nation will be too hard hit by the future tariff-less, quota-less "Common Market." IRFSC laid the groundwork for its new subcommittee at a special Paris meeting in May.

**More on Big U.K. Merger**—It probably came as no surprise to anyone in the trade that Courtaulds' stockholders approved the purchase of British Celanese, Ltd. (See Report from Europe MTM, June '57.) The stockholders agreed to boost Courtaulds authorized capital from 58 million to 82.5 million pounds sterling; issued capital from 56.2 to 70.7 million pounds.

Sir John Hanbury-Williams, chairman of Courtaulds, reassured the special stockholders meeting that the new company, a virtual monopoly of U. K. man-made fiber production, will not abuse its unique position. Meanwhile, Courtaulds revealed net profits for the year ended last March 31 had dipped from over 10.4 million pounds in 1955 to just under 8.5 million in 1956. Profits from export, especially, were down, but domestic sales also slipped due to weakness in filament yarn.

**Better News from I.C.I.**—Imperial Chemical Industries, Ltd., disclosed good news about both Terylene yarn and staple fiber. In the company's annual report for 1956, I. C. I. said Terylene yarn sales jumped 80%, while Terylene staple fiber sales doubled. The big boom occurred in Terylene blends with wool for use in men's and women's worsted wear.

I. C. I. is now producing Terylene at an annual rate of 22 million pounds of fiber. This will be boosted to 30 million in 1959. Increased demands are expected from manufacturers of skirts, trousers, suits, curtains, industrial belts, paper machine felts, cordage, fishnet twine and fire hose. I. C. I. didn't fare as well with its Ardil (protein fiber). There was no appreciable change from 1955. Nylon was good, and capacity is being raised soon to 60 million pounds annually.

**New German Glass Fiber**—Aachen-Gerresheimer Textilglas, Gevetex, has just been formed jointly by Gerresheimer Glashuttenwerke and Vereinigte Glaswerke with a 10 million Deutsche Marks capitalization. The firm will make glass fiber and thread under the name "Gevetex." It will be marketed through Textilglas-Verkaufsburo, Dusseldorf.

**Germany Slates Asia Imports**—In the past three months, the West German government has issued over 100 million DM of import licenses for staple fiber and cotton fabrics. Most of the imports will come from Japan and India. The reason: To hold down domestic prices. Bonn tested this theory recently with textiles and leather goods from other European countries. German importers responded with alacrity. The German State-owned railways are testing nylon-wool fabric blends for use as seat coverings.

**Dumping with a Vengeance**—There are few nations without a textile dumping problem to cope with. But Norwegian mill men probably have it the worst of all. Oslo has been told by its hard-pressed textile manufacturers that Eastern Europe has been shipping in all kinds of textiles at official prices as little as 10% of their home value. A general boycott is being urged by all. The Federation of Norwegian Textile Manufacturers reported 1956 output up 5% and imports up 10%—exclusive of the East European dumping. Actually, the volume from Red Europe rose 70%—but not at the prices on the invoices.

(Continued on Page 61)

## REPORT FROM JAPAN



### Japanese cotton goods exports to U. S. are lagging while production and inventories reach new highs

By B. Mori

OSAKA—Exports of cotton textiles to United States have been extremely disappointing during first half of this year. Long delay in fixing quotas is partially responsible. But even so, exports have been below levels which quotas permit. This is all the more surprising since prices here have been on low side recently. One possible factor is the slackened demand for textiles in the U. S. for the past few months.

Exports to other countries have been holding up well since end of last year, although political strife in Indonesia does not augur well for Japanese exporters.

**Cotton Curtailment on Agenda**—By the time these words are in print, Japan may be going through another of its periodic cotton textile curtailment programs—largely the result of irresponsible and speculative activities by many small spinners and weavers. Japanese Government has only recently been able to force these small spinning mills, which own 40% of nation's producing capacity, to reduce operations to 16 hours a day in place of two 9-to 11-hour shifts they had been running.

**Cotton Cloth Output Soars**—During past few months there has been a continued build up of inventory at all levels, from spinner to wholesale clothing distributor, with resultant financial distress and pressure on credit positions. Meanwhile, production of cotton yarn and cloth have reached new postwar highs. This sort of upswing has always occurred just when a curtailment plan is in offing—an effort by each mill to squeeze in as much production as possible before the cut-back, thus aggravating situation further.

Under pressure from Japanese Government “to avoid trouble with U. S.” exporters of clothing have devised regulations for items containing some of rayon. In order to make every effort to honor cotton-goods quotas, Government and industry are declaring that even goods containing minor proportion of cotton are to be considered “cotton goods” for purposes of quota control. But, as noted earlier in this report there is no sign of control action here to limit export of all rayon products to U. S.

**Styling of Rayon Products Outstanding**—Several independent observers have commented that rayon and synthetic fiber products made the best showing of all Japan's textile products at recent International Trade Fair in Tokyo. Exhibits showed that styling and diversification of end-products have kept pace with the great increase in production in recent years.

The export picture for rayon staple products continues bright. A postwar record will probably be reached this year in export of staple fiber; shipments of spun rayon yarn and cloth are active. Actual figures for first quarter of 1957 are: 5,576,000 pounds of staple; 9,478,000 pounds of spun yarn; 184,000,000 yards of spun fabrics. A price-fixing cartel has been devised to prevent sales at below-cost prices due to recent over-production.

**Synthetics Exports Bring Home Bacon**—The man-made fibers and fabrics industries (as well as secondary products) are becoming increasingly significant to Japan's economy. Since few imported materials are needed, they earned \$250 million for Japan, net, on export sales of \$280 million last year. The net figure is equal to 20% of Japan's entire foreign exchange holdings.

Production of rayon pulp edged over 100,000 ton mark for the first time in the first quarter of this year—25% gain in a year! Production of dyestuffs was 5,600 tons in first quarter, a gain of 300 tons over comparable 1956 period.

# DYEING and FINISHING SECTION

weigh  
all  
the  
advantages  
of  
Cupropheryl\*  
Dyestuffs

- cost reducing
- time saving
- wash and light fastness

Weigh all the advantages of this group of Geigy dyestuffs—their ability to reduce production time—to provide economy and excellent results on cotton or rayon.

Weigh these against the fact that although these direct dyeing colors are highly fast to light and washing with simple copper after-treatment, some dyes are slightly faster.

Make this small concession from the very fastest and Geigy Cuprophenyls will become more important, more profitable tools to you for dyeing cellulosic fibres—particularly washable cotton or rayon knit goods—piece goods that need crease-proof resin finishes.

Your Geigy representative will be glad to give you full details.

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# GEIGY

DYESTUFFS

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PROCESSING

## Edwin J. Stoeckel

(Continued from Page 34)

respondence Schools, which incidentally, like Black Diamond, is another fine old Scranton institution.

At the Morrison mill, production was largely silk taffetas for petticoat manufacturers. The fabrics, all skein-dyed, were 36 inches wide and sold for 75 cents to 80 cents a yard. The raw silk used came mostly from Italy. In 1903 Morrison's was re-organized and became the Black Diamond Silk Co. with George J. Schautz as general manager. In 1928, when Schautz retired, Stoeckel succeeded him.

The silk business grew rapidly in the early years of Stoeckel's service with Black Diamond, and then in the black years of the late 20's and early 30's, it rapidly declined. Silk mills that had sprung up like summer grass throughout New Jersey and Pennsylvania disappeared one by one until only a handful remained. In 1926 Davison's Directory listed 42 silk mills in Scranton alone. Today there are only 11—some of them one-man operations. Names that were once full of renown and synonymous with princely profits along Madison and Fourth Avenue in the days of silk's glory grew dim with mill closings and liquidations, and in time were forgotten.

But through this steep decline of the silk trade, Black Diamond managed somehow to stay alive. In the depression years, Ed Saar recalls, the company was reduced to doing commission weaving for a fee of five cents a yard! For this the mill took in raw silk, degummed it, ran it carefully through all the twisting and spooling that is part of the throwing operation, then made up warps and wove the fabric according to the high standards of which Black Diamond has always been proud.

In those lean years, Black Diamond's throwing department also sought commission work. At that time, Carl Luft wryly recalls, the business was so competitive that it was a painful joke among throwsters that nothing in the throwing business was thrown away. The fiber matting which packaged the silk bales arriving from Japan was carefully put aside to be used for packing the finished yarn when it was shipped out of the throwing mill. The cord that bound the "books" of skeined silk in the bales was saved to be used around the shop. The picturesque "chop" tickets, or silk growers' labels, on each book were carefully preserved so that their blank reverse sides could be used as work tickets in the plant.

By dint of commission throwing and weaving Black Diamond kept going through the thirties. In the war years of the early forties, Stoeckel, unable to get raw silk, out of necessity wove rayons and acetates for the New York dress goods market. The painstaking weaving skills, the overall high standards of cloth quality that had been part of Black Diamond's high reputation through its long years as a silk weaver were carried over into its production of synthetics. Today, Edwin Stoeckel can open the filing cabinet in his office and show you samples of the fine rayons and acetates his company wove during those years. When the war ended and silk was again available, Stoeckel lost no time in getting back to his first and only love among fibers. He knows how to weave filament synthetic goods, but he prefers to work with silk.

In 1945 something good happened to Black Diamond, a change that gave the old company a new lease on life, and a new incentive to concentrate on high quality silks. In that year, at a time when the company was handling work for seven different New

SAMPLE C-24		Date 2/18/56
383 Jwill Silk Sheen		
Reed: 55 @ 3	165 ct	Width 48"
Yarn: 3# $\frac{20}{22}$	55 turns	
Ends 7952/1		Wgt. 14.40 Lbs.
Warped 1-R #1-L		
Filling: 112 P. W.		
Yarn: 3# $\frac{20}{22}$	55 turns	
Dye: Piece Dyed		Wgt. 9.50 Lbs.
Woven 2-R #2-L		
		

**WORK IN PROGRESS**—In his time, Edwin Stoeckel has analyzed thousands of fabrics and prepared reports and "weave pictures" such as this one. His only formal training in this work was a correspondence school course.

York converters, Stoeckel became acquainted with Jack Lessmann of Syntex Mills in New York City. Lessmann was tremendously impressed by Stoeckel's skill as a silk weaver as well as by Black Diamond's old-fashioned devotion to good quality fabrics. Stoeckel is a man who feels most at home in his own little mill in his familiar native city of Scranton. He had never been at ease trying to recruit business in the complex New York textile market. Lessmann and Stoeckel decided to join forces. The arrangement has worked out well. Stoeckel says that Jack Lessmann and his Syntex Mills have been the salvation of Black Diamond, while Lessmann has been greatly satisfied with the arrangement which has assured Syntex a steady supply of fine silk dress goods at a time when silk has been gaining in popularity in the better women's dress trade.

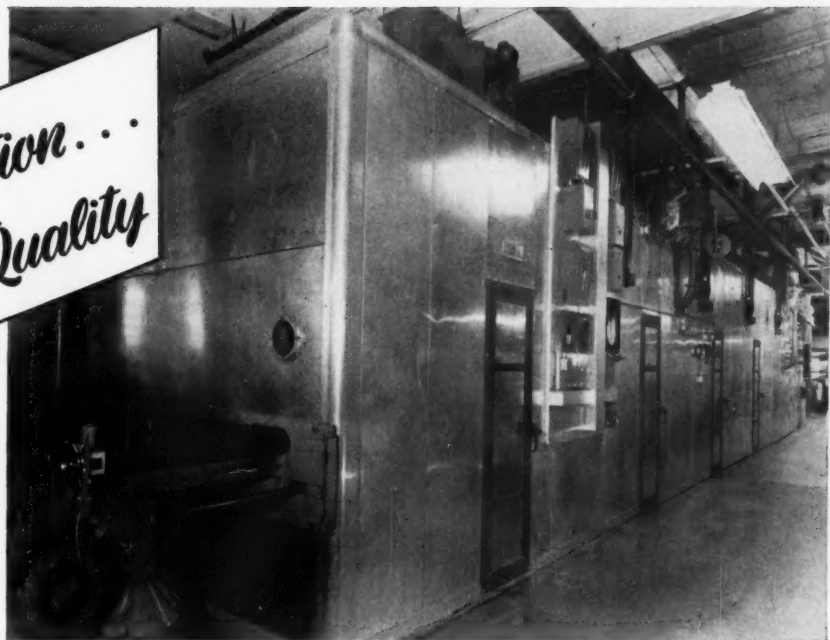
This year, Edwin Stoeckel will complete 59 years in the silk manufacturing business. In that long lifetime of activity he saw the American silk industry grow at a dizzy pace, bringing huge fortunes to many mill operators and fabric merchants. He saw the industry decline faster than it rose, leaving behind it empty mills, idle machinery and many fortunes frittered away. And now in his old age he has survived long enough to see a mild revival of demand for fine silks, a revival that once more brings into play the skills in silk weaving which few in the textile business besides himself possess. In this respect, Edwin Stoeckel is in a position to appreciate the value of longevity and survival if you are in the silk industry. Happy once more to see the silks he loves in demand, he looks forward to many active years working six days a week in his mill weaving the fine silks which he believes have a beauty and prestige no other fiber can approach. ■



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**an interpretive report**

## The Knitting Show Analyzed

**By George A. Urlaub**  
KNITTING CONSULTANT

Knitting expert Urlaub searches out the significance, in terms of production economies, of the tremendously wide variety of exhibits at the recent knitting trade fair

**T**HERE IS a Latin proverb which says, "Times change and we change with them." How true of this year's Knitting Arts Exhibition! This show placed on view some unusual developments in all types of knitting machines. Some old names long associated with certain machines were missing or were not promoted. Other old names appeared on new machines, and there were also new names on new machines. New developments have taken place largely at the expense of old, formerly entrenched machinery.

In our report on the 1955 Knitting Arts Exhibition (MTM June, July '55) we emphasized the changes brought about as a result of some mills entering new fields related to their own lines and other mills making significant changes of products in their established market fields. Examples here are the revolution in the American outerwear industry from cut-and-sewn to full-fashioned goods, and the continued influx of hosiery mills into outerwear, bathing suit and other lines. Now, in addition to mill changes of products, we also have changes of machine types by at least four machine builders.

The glamor so long associated with the women's full-fashioned industry seems to have worn thin with the present state of the industry in which still fewer machines make still more goods than the market appears to want. We now see the old-line full-fashioned hosiery machine builders, like Reading and Kalio, still making full-fashioned machines, but almost relegating them to the side while they have

taken up production of other machines. In fact, one name, Wildman, is missing completely in full-fashioned hosiery machines.

Each of our machine building companies has production facilities, including some of the finest machine tools in the world and top engineers and machinists, all devoted to building fine knitting machines. Thus we have some new names on warp knitting machines, some on circular machines and new full-fashioned outerwear machines.

As we see it, most, if not all, of these names will earn for themselves a fitting place in the industry. Of special consideration is the good engineering and fine craftsmanship so evident in many of the new machines. Much of this is no doubt the outgrowth of engineering and production perfection demanded of machine shops and mechanics by previous war production needs.

In the full-fashioned machines we find the usual names as before, except that outerwear machines are receiving the major share of attention. The long years of apprenticeship formerly necessary for knitters, helpers, toppers, and loopers of hosiery have been overcome gradually in recent years by the ability of thermoplastic yarns to conform to an acceptable foot fit in women's single-unit stockings. The change to the single-unit style has eliminated toppers. More recently, the change to the loopless toe has overcome the scarcity of fine-gauge looper operators.

In both hosiery and outerwear full-fashioned machines the emphasis is on automation. We have had automation, more or less, on the single-head hosiery machines by Wildman and on the two- and four-section machines built by Reiner. We hear that Bentley's English built "William Cotton M-100" has automation, and similar claims are made for the 40-section Schubert & Salzer machine reported to be building in Germany.

Electronic motor controls and current converters have enabled great strides to be made in power flow and variable speeds necessary in full-fashioned machines. Electronic circuits and secondary motors, intercoupled with the standard chain and mechanical controls allow automatic welt, thread carrier and friction engagements and disengagements, carrier and spindle racking, welt-turning and several other automatic operations heretofore only accomplished manually. At first glance the latest 14-position chain controller appears to be a mechanical nightmare, but its coordination with the short-chain and other connections and linkages soon smoothes out direction and activation to flawless operation of these big machines with a minimum of operator attention.

### **Improvements in Outerwear Machines**

A number of the automatic features are carried over from the hosiery machine into the outerwear machine, but it will be a while yet before these will attain the same degree of independence of operator manipulations. The basic machines of this type are hardly off the production line and already demands are made for intarsia and lace work, V-neck and sleeveless fashioning, and, lastly, a combination ribbed cuff—jersey body machine with auto transfer mechanism. In this latter respect, we have seen some lace work effects in a hemmed bottom or welt, but this, in our opinion, is a poor substitute for a true rib, necessary for bottom, cuff and collar ribs.

There is some talk in the market about a coming auto-rib—jersey body fashioning William Cotton type machine, supposedly building now. It may be possible to add a latch-needle or some loop forming hook-needle bar mechanism to function in conjunction with or off the needle-bar motion. This mechanism could be installed at or immediately under the front table of the machine to make a form of combination rib-fabric, with a lace-bar stitch transfer to the intermediate frame needles for regular plain-stitch work. It seems questionable, however, whether a William Cotton type spring-bearded needle "Auto-Rib" assembly can be accomplished at practical cost on a "fashioning" machine.

It is true that the men's hosiery market did accept to a large extent the "HH" rib-cuff as a substitute for the true-rib cuff of transfer goods. But this was helped along a great deal by the widespread use of rubber in hose cuffs and the shorter ankle sock vogue. It will remain to be seen if an "HH" or similar substitute ribbed construction will be acceptable for the quality product represented by full-fashioned outerwear. Of course, there is always available the "hem bottom" or welt construction on jackets and sports shirts. Then also the "Samco" (Monk) English machine has an automatic bar transfer mechanism.

The newest American built William Cotton type hosiery machines were not exhibited at the knitting show, but were featured in working mill installations by both "Reading" and "Kalia" builders.

Textile Machine Works operated a shuttle-plane

service between Atlantic City and Reading, Pa., where their latest "Reading-100-Automatic" machines were operating in the Berkshire Mill. The latest "Reading automatic" has two automatic 2-carrier friction boxes, going in and out, for knitting stretch stockings or stripes in the welt. Automatic alternation of two carriers for main and welt yarns is included for making stretch fabric. This new machine has a "universal" narrowing head which moves the fingers in and out, up to 6 needles, without attention from the knitter.

This device is flexible to allow for narrowing and widening 1 or 2 needles, when and as needed, and to include a "diamond-gore line" toe formation. However, this is not the familiar "diamond-toe" as produced by the two narrowing fingers and cover-knives of the footer knitting machine now obsolete in this country.

A new electro-heat device will also shortly be available for severing the main and splicing thermoplastic yarns, entering from the right.

Fancy heels and novelty constructions requiring up to 4 and 5 carriers are not yet fully automatic. A number of these new "automatics" are reported in operation in several mills, mostly in 60 gauge, with several also in 75 gauge. Automatic unhooking of the welt takes place, but the welt wires are laid in by hand. Re-engagement of the welt-turning mechanism is semi-automatic in one operation.

Not to be out-done by Textile Machine Works, Karl Lieberknecht, Inc. also announced in March their new "Kalia Automatic Non-stop" 32 section, 14½" needle-bar hosiery machine, designed to run at a basic 100-course per minute speed. In this newest Kalia version all frictions are automatically engaged and disengaged, and all thread carriers are automatically introduced and idled. A servo-motor drives the carrier-rod and narrowing spindles, which are also auto-positioned and reset as required.

### **New Automatic Features**

Button or chain changing is not necessary on this machine which incorporates an automatic size-changer, with size-marks, leg and foot lengths set by a simple lever shift. Spring mounted slur-cams and automatic weight take-off are also featured. The "Miller Patent" overhead gear automatic welt turner, long associated with the Kalia auto-welt machine, has an automatic hook-up and take-up strap engage-



A mill installation of Lieberknecht's "Non-Stop" hosiery knitting machines.



ment that eliminate hand operations in welt turning. The company has thus far built close to 100 of 66-gauge auto-welt machines, with a number of them in Canadian, English and German mills. Kalio also built some 39-gauge machines last year for installation in Norway. Lieberknecht's 75-gauge, 32-section machine is also of the "non-stop" type in which all speeds and frictions, etc. are automatically controlled, by a combination of electronic and mechanical controls, with an absolute minimum of manual attention. The company claims this new type, which could be seen in operation during the Show at the Perkasio Hosiery Mill, in Perkasio, Pa., can readily be operated by one knitter without a helper. The difference in cost per machine of the automatic over the standard, in 60-gauge for example, is \$4,500.

In connection with the development of finer gauge knitting machines, there have been introduced in recent years the 90-gauge experimental machines built here by Wildman and the 90-gauge Wieland "AWRA" machine made in Germany, the latter actually a re-gauged machine. These machines, however, have not demonstrated great practical advantages and it is not expected that they will be widely adopted by hosiery mills in the foreseeable future. The likelihood is that the standard 75-gauge machines in regular production in this country will serve for a long time as the most widely used equipment for production of ultra fine gauge hosiery.

Regarding spring needle rib trims for full-fashioned outerwear bodies, we noticed an announcement some time ago of the offer in the U. S. of a French-built William Cotton type full-fashioned rib machine in 3, 4, 6, 9 and 12 sections. This machine, with its 13½" needlebars and equipment for making solid color and striped trims, should prove interesting to mills making high quality lines which have had difficulty getting the desired elasticity in bottoms and collars when knitted of some synthetics and blends on regular 1 x 1 latch needle ribbers.

## FABRIC AND BODY MACHINES

### Warp Knitting Machines

The story of the Raschel machine in the American mills has been somewhat stagnant for many years, although it has gone through 2 or 3 waves of popularity during the past 30 year. Since the days of the "artificial silk" jacquard Raschel scarfs, we have seen imitation hand-knit openwork wool shawls, some lace and curtain fabric production, and more recently the covered rubber yarn "power net" fabrics used by the corset and girdle manufacturers.

During the past several years we have also seen several patents for hexagonal mesh and tulle fabric veiling and net constructions made on the Raschel and featured by a number of mills. These fabrics were heretofore made on the bobbinet twist machine. In addition to the latter fabrics, numerous narrow laces were also knitted on Raschels with drop-stitch separating wales between. As the results of these lace efforts we soon had wider laces being made on Raschels and with overlay and outline yarns producing patterns and effects previously only made on the Levers (go-through bobbin) lace machines. Very few, if any of the Levers machines have come into this country since right after the turn of the century, but then these big heavy English-built machines are practically indestructible and a number of large mills still function around their product.

Now, however, technical advances incorporated in the recent models of the Kidde (American) and the Mayer (German) Raschels are such as to challenge the supremacy of the Levers machine in making fine laces in not too large and all-over repeat patterns, as opposed to large full-jacquard patterns in curtains and table-spreads.

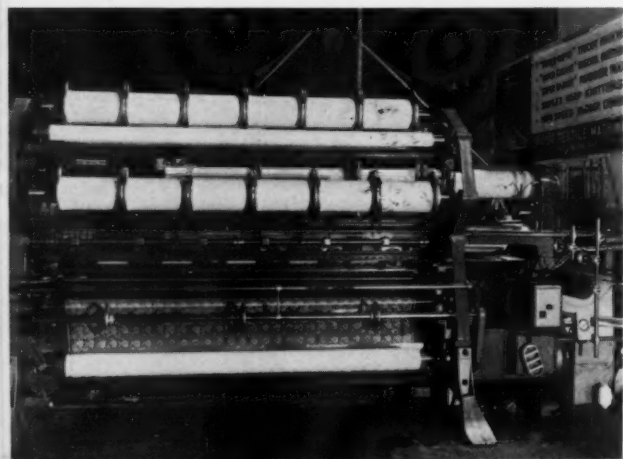
KIDDE MANUFACTURING CO. who has been building Raschel machines for a number of years for nets, etc. and who already has a 10-bar machine in operation, has been at work for some time on a 14-bar machine. We have now been informed that their first 14-bar lace machines are currently being delivered to the trade.

MAYER TEXTILE MACHINERY CORP. exhibited for the first time at the Show their new "Super Garant," 18-bar Raschel machine, 100" wide in 36 gauge (latch needle, 18 n.p.i.) which ran on a 3" wide strip lace at a break-in speed of 250 c.p.m. Mayer claims this to be the only 18-bar Raschel machine made and the Show machine was reported to be their eighth one built. This machine ran 3 bars for ground, threaded with 40 d. nylon, and 15 bars in the pattern, with 150 d. nylon in the pattern proper and 60 d. nylon in the outline.

Another important recent development Raschel is KARL LIEBERKNECHT'S "Premier '100' machine" which has been redesigned and knits pile fabrics, as plushes, etc., upholstery fabrics and carpets. The pile loop is actually knitted into the fabric, as can be done readily in warp knitting, and is not laid as on a circular weft machine. The loop is drawn out in yarn feeding by a cam-operated downward oscillating hook-bar, as opposed to the older type falling or chopper bar. This appears to be the first practical knitting machine to produce a pile fabric of the locked-tuft type usually produced on weaving or carpet looms. This new machine with its locked pile loop, should also produce a shaggy carpet superior to that of the tufting machine. This may also be the reason for Lieberknecht's discontinuing their multiple-stitching machine.

As the weight of fabric produced depends only on the machine gauge and the yarn sizes used, it is expected that this versatile machine will find much use for production of upholstery fabrics and carpets. Both are large consumers of the man-made fibers, alone or in combination with natural fiber backing or in designing fabrics utilizing both fibers in the pile. A 15-foot-wide carpet machine is presently on the drafting boards, according to a company report.

The Lieberknecht "double Raschel," shown at the



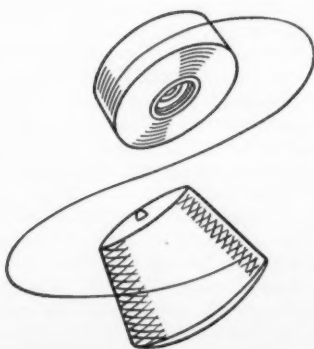
18 bar Raschel "Super Garant" machine exhibited by Mayer Textile Machine Co., West New York, N. J.



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sale  
yarn**



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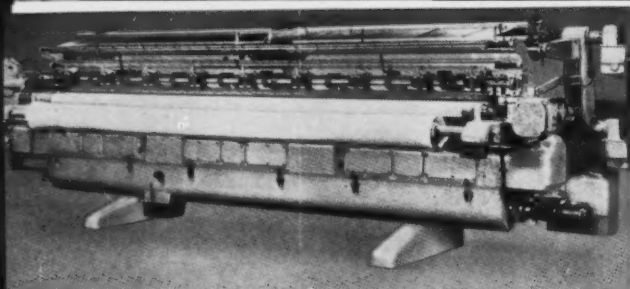
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Kidde's FNF 168" Warp Knitting Machine

1955 Show for the first time—the two fabric producing (Shuster patent) latch needle warp-knitter—is still undergoing engineering and testing and may soon be in production.

The F.N.F. machine was first shown in a public exhibition in this country by its licensee and builder here, the KIDDE MANUFACTURING CO., having previously only been shown privately to interested mill men and only in the 84 inch width. This is the warp knitter developed and built a number of years ago by F. N. F. in England around the use of their "sliding tongue or tubular" needle. This compound needle is driven in its loop-forming and fabric making notions by twin-coupled eccentric shafts. The machine shown this year, the Mark VII, was also designed particularly for the American industry in the 168-inch needle-bar width. The machine ran 40 denier zero twist yarn at 925 c.p.m., or slightly under its 1000-course-per-minute rated speed. This machine, when fully assembled, weighs six tons. The machine produces the usual tricot stitch fabrics. The Aveco, regular spring beard needle, high speed tricot machine, previously made here by Kidde, is being discontinued and is being replaced by the F. N. F. in the Kidde tricot machine line.

This then brings us to the more conventional type of warp-knitting machines, the spring needle tricot machine which was sponsored by three exhibitors but shown in operation only by one.

Whitin did not show a machine this year. Textile had their new machine which they announced at the close of last year, in operation at their plant in Reading. The "Reading" tricot machine is of the rigid solid bar type, with needle motions driven by eccentrics from two crankshafts, with balanced driving members and motions to permit high speed operation, claimed at 800 c.p.m. for the 168" width.

The only conventional tricot machine operating at the Show was the Mayer "Superrapid." This was a 28 gauge 168", two-bar machine running on raw (un-thrown) nylon in regular tricot "jersey" fabric at 800 c.p.m. This Show machine was also used to demonstrate the Lindly photo-electric scanner to stop the machine when a fabric defect is present. This device

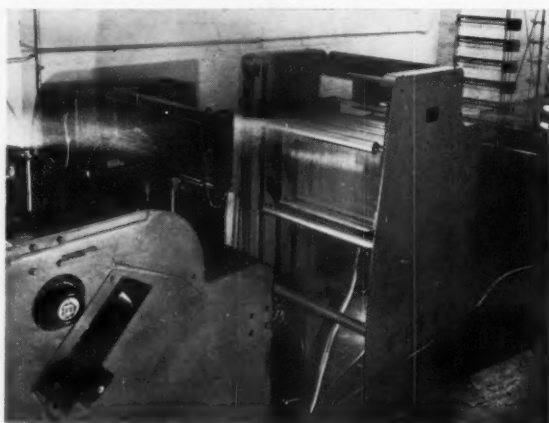
was one of several quality control "tools" which proved of special interest to mill men.

Other mechanical exhibits of special interest to tricot mills included the following:

COCKER MACHINE & FOUNDRY CO., manufacturers of warpers, creels, tensions, etc. had the first showing anywhere of their new Model MB 50, tricot warper. This machine is built to take two 21" tricot beams, one 74" beam or one 50" beam. It runs at usual warper speeds up to 600 y.p.m., has an air-operated presser roll, an automatic doffing device and is backed electronically to reduce warp tension.

HAYES INDUSTRIES showed two 30" aluminum tricot beams designed for rayon and nylon, both with forged rib head construction.

KIDDE MANUFACTURING CO. showed their new Kidde-Sipp tricot warper for 42" beams. This is equipped with two compression rollers, hydraulically loaded; loading and doffing is automatic and yarn speeds from 75 to 600 y.p.m. The Show machine also had a 30 yard capacity accumulator.



Kidde demonstrated this 21" accumulator in conjunction with the company's Kidde-Sipp tricot warper.

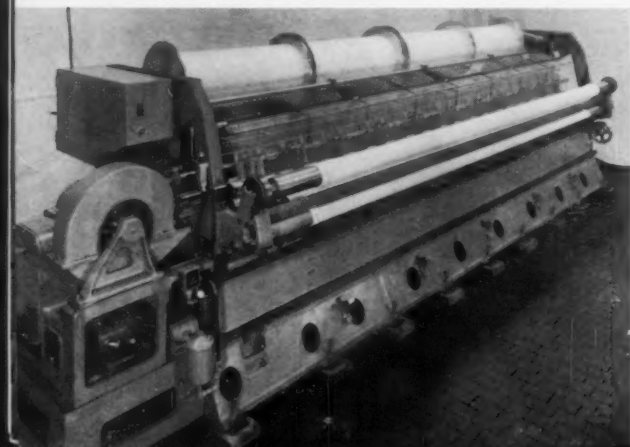
MILTON MACHINE WORKS showed an aluminum alloy tricot beam with forged heads.

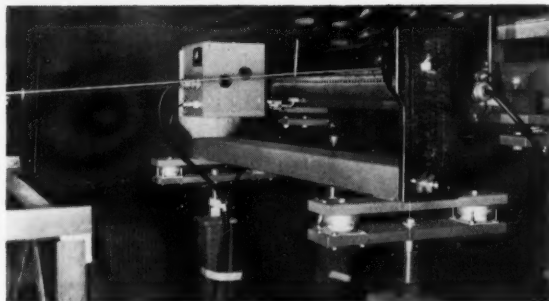
ROBERT REINER, INC. showed their American-built heavy duty tricot warper Model HSW-21 running two 21 x 21 section beams. This warper, which can handle up to 32" diameter and 42", also has an automatic doffing mechanism. All controls, including speeds from 100 to 450 y.p.m. are contained in a control box mounted above the motor drive at the right. A tachometer generator maintains constant yarn speed with plus or minus 1% accuracy claimed.

ALFRED, HOFMANN & Co. had some interesting working models in operation consisting of: Brueckner's tenter frame equipped with a combination pin and clip chain of advanced design; Erhardt & Leimer fabric guiders, mechanical and photo-electric selvage feelers, selvage uncurlers, and an electro-magnetic feeding device.

At the REINER booth a working model of the Reiner-Famatex tenter frame was in operation at from creep-speed to 220 y.p.m. controlled by a push-button panel. This tenter is now equipped with an overfeed wheel for positive pin-feed engagement, with the clip-chain now riding on an oilless track. A new combination pin-clip clamp was also demonstrated which permits instant change from clip to pin, and back again as needed. Another new feature is the 1-needle shift of the pins to prevent work from riding off.

The "Reading" tricot machine manufactured by Textile Machine Works.





Lindly's Automatic End Break Detector

LINDLY & Co. displayed a photo-electric cell controlled warp end break device for use between the creel and the warper to eliminate drop wires for that purpose. A broken end falls into the path of the light beam, interrupting it and triggering the stop motion control.

EDWARD J. MCBRIDE Co. showed a new heavier and stronger swing-arm assembly for creels for rigid support of heavier package and easier mounting. A new indicating light system indicates the definite creel bank in which the break occurs.

#### Flat Machines

DUBIED MACHINERY Co. showed their DRB machine with two 36" beds making ribbed trim for full-fashioned outerwear. This is a double-lock machine with high- and low-butt needles, and stitches can be transferred from front to back bed or vice versa.

The KNITTING MACHINE & SUPPLY Co. showed three Lamb-type (V-bed) flat German machines made by Stoll & Co. of Reutlingen. These were:

Model AJUM, 60" full automatic double system, eight-lock machine with full jacquard (front and back) a patented automatic stitch transfer on both beds, and two-speed motor drive. This machine produces all kinds of jersey or rib stitch effects, including a six-needle rack "noppen" and eyelet work. Although many of their machines have been delivered in mills all over the world, this is its first American exhibition.

Model JBOM/b, fully automatic, single system, plain rib machine with high- and low-butt needles, now made in 5 cut for making collars, cuffs, and bottoms for full-fashioned goods. To demonstrate the versatility of this machine it was simultaneously producing three distinct patterns in collar work.

Model KAOM/j, automatic jacquard border machine for making multi-patterned and colored trim, edgings, and scarves, etc. This 10 cut, 15 3/4" bed machine has a 12-sided drum, front and back, and 1-or 2-needle rack. It produces all manner of stitch and color designs through a short chain controller instead of a paper card. This is its first American showing, although it was in the Brussels exhibition last year.

QUEENS MACHINE CORP. showed two models of their double-lock automatic V-bed flat machines in 60" and 10 cut. Model BD has push jacks on front and back beds, operated by separate cam tracks in the carriage to pick up the jacks or high- and low-butt needles as desired. This 8-carrier machine produces a great variety of jacquard patterns in reversible solid color design on either side of the fabric, with a draw thread insertion between parts.

Model AB, also 60" and 11 cut, is somewhat similar to the above model, but produces simpler pattern

trims at a higher rate of speed. Also shown was a 2-head (circular) string machine with 26-needle and 62-needle cylinders for strings and covering fabrics.

ETABS. SERVO-STOP of France showed for the first time a power driven jacquard border machine, Model MJT, for outerwear trim. This enclosed case type of V-bed machine knits up to 6" and wider borders or trim strips in true jacquard work, including stitch and color patterns as well as tubular and raised fabric effects. A mercury switch stop motion and carriage, and a minimum space between strips (2 c/m) are features of this machine. Another model, MJ, in 12 cut, produced 4 borders at once. Mac Rothkopf, American agent, also showed the "Hepworth" single thread sweater looper, with constant rotating dial, and the McRoth fabric slitter.

STONEHILL KNITTING MACHINES CORP. had in operation three automatic V-bed machines built by Universal of Westhausen, Germany for outerwear fabrics, borders and trim. These were Supramat SF, 10 cut, 63" bed, and Tricomat S, 10 cut, 31" machines. These are 8 carrier, tubular-lock machines for a wide range of patterns in stitch and 4-color on high- and low-butt needles. Slack and separator course, and 10 needle rack are included, with all changes activated through a chain and short chain controller.

Although both these machines are designed for automatic operation on body parts in stripe and stitch effects, they are currently being used largely by cut and sewn interlock sweater mills for styling up otherwise plain garments by addition of these patterned collars and trims. The Suprafix SG model, shown in 10 cut, 24" makes up to 6 or more border strips and narrow trims.

TRICOMA, INC. featured as part of their display two fully automatic V-bed single-lock power machines for outerwear. These were Hertel & Richter's "Automatic" models C/e and MCI, both in 63" width. Model MCI functions mechanically through paper card mechanism, while Model C/e has electromagnetic controls for all motions and changes through a perforated microfilm at the side. A 2-speed motor automatically slows down for slack course and also while a yarn knot knits into the fabric, returning immediately to full speed. Solenoids control the carrier engagement and disengagement. A 6-needle rack to either side with half or full-cardigan tuck or noppen-stitch are available as desired through high and low-butt needles. The entire automation can be put out of action for plain knitting by a simple switch change.

Note: A second part of Mr. Urlaub's report, to appear in the August issue, will cover Circular Knitting, Hosiery, and Auxiliary machines.



The exhibit of Synthane Corp., Oaks, Pa.



### Bonded Nylon Batting

Star Woolen has announced a bonded nylon batting, Ny-Sul-Loft, which is said to be unique in that the bonding has been accomplished without materially decreasing the natural loft and resilience of crimped nylon fibers. The batting is completely bonded throughout and, in apparel application, it permits it to be used without fear of "creepage" even with relatively porous, open fabrics such as knitted nylon tricot. Ny-Sul-Loft is reported to have all the attributes of nylon fiber itself, such as being non-allergic, flame retardant, free from attack by moths, mildew, and to possess all its "ease of care" features.

### 3-D Upholstery Fabric

Trilok, a new three-dimensional upholstery fabric made by the Textile Division, United States Rubber

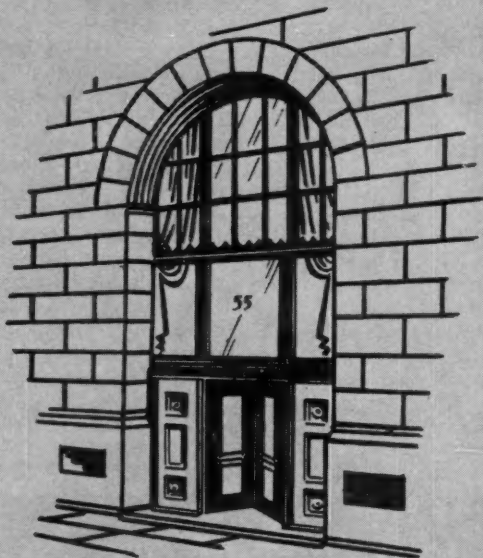
Co., is fast gaining acceptance in quality furniture, according to the company. Fourteen of the furniture manufacturers at the National Home Furnishings Show in Chicago, are said to have exhibited Trilok in upholstered lounges, sofas, occasional pieces and sectionals.

### New Felt Applications

American Felt Co., Glenville, Conn., has announced new applications for felt. It now has available for automobile design engineers a new autobrake filter made of rayon acetate windsor felt, and stamp pads, for acid etching solutions, made of Dacron synthetic fiber felt. The airbrake filter felt weighs 235 ounces per square yard and is priced at \$30.50 per 48 by 66-inch sheet. The stamp pads come one-quarter inch thick in the density of 48-inches or three pounds per square yard, and 72-inch width stripped to 1-inch.

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## For the DYER and FINISHER

### Emersol Stearic Acids

A new 24-page booklet, "Emersol Stearic Acids," is available from Emery Industries, Inc. The brochure is designed to aid in the selection of the proper grade of stearic acid for each end use. Analytical tests, physical properties of commercial stearic acids and their relation to its palmitic stearic acid ratio, are described. *For copies of this booklet write the editors.*

### Stauffer Sulfur Brochure

"Stauffer Sulfurs," a new 48-page brochure on sulfur, is available free from Stauffer Chemical Co. The brochure describes production, refining techniques and uses for sulfur. It also includes specifications for the several types of conventional and insoluble sulfurs used in industry and agriculture, and tabulations of the physical and chemical properties of the material in its different forms. *For copies write the editors.*

### Sulfonic Acid AA Bulletin

The market research and development department of Tennessee Corp. has published a new technical data sheet on Sulfonic Acid AA, a high active dodecylbenzene sulfonic acid. The sheet includes formulas and procedures for preparing customized salts of Sulfonic Acid AA. *For copies write the editors.*

### New Harodite Warehouse

Harodite Finishing Co., Inc., has moved into a modern, one-story 25,000-square foot warehouse at 100 Oak St., Taunton, Mass. The move not only has relieved congestion in Harodite's main North Dighton plant to provide space needed there for the installation of new dyeing and finishing equipment but the new Taunton warehouse will increase storage and handling efficiency and expedite delivery of finished goods.



# MACHINERY and EQUIPMENT SECTION



## Mitchell-Bissell "BLUE SATIN FINISH" Porcelain Guides

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## New MACHINERY

### New EQUIPMENT



#### New Pilling Tester

The United States Testing Co. has completed the trials of its new pilling tester. The tester, which conforms to ASTM specifications (D-1375-55T), is now available to industry. In the new instrument a complex rubbing and twisting action is achieved by contact of a reciprocating table, which holds the abrasive, and rotary head, to which the sample is attached. This rotary action, the company reports, most faithfully simulates the type of wear instrumental in causing fabrics to pill.

For further information write the editors.

#### Rubber Roll Regrinding

Rodney Hunt Machine Co. has issued its latest industrial roll engineering report (No. 12), entitled "Regrinding Rubber Rolls." The report deals with conditions which make regrinding rubber rolls necessary, modern grinding equipment and the methods by which those firms doing their own regrinding may achieve the best results. Sources and specifications for several all-purpose grinding wheels are listed.

For further information write the editors.

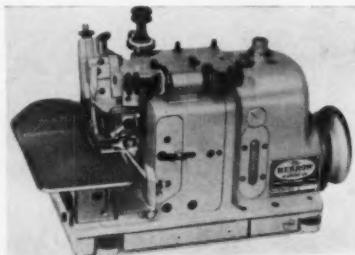
#### Rag Cutter Feeder

Automatic continuous feeding of rags to a rag cutter at the rate of 15,000 to 25,000 pounds an hour

is now possible, according to Taylor, Stiles & Co. The company is now producing a combination bale opening and feeding machine which takes whole bales of rags, opens them up and feeds them automatically to the feed apron of a cutter or to a sorting apron. Jamming has been avoided, it is said, by an improved design of the feed roll. For further information write the editors.

#### Stainless Steel Data

A 40-page booklet entitled "Stainless Steel Report to the Textile Industry" is now available from the Advertising Department of Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa. The four-color booklet gives detailed information on the textile industry, including yarn manufacturing, warp preparation, dyeing, bleaching and finishing. One section deals with the corrosion resistance of Allegheny Ludlum stainless steels to various media, especially those met in the textile industry.

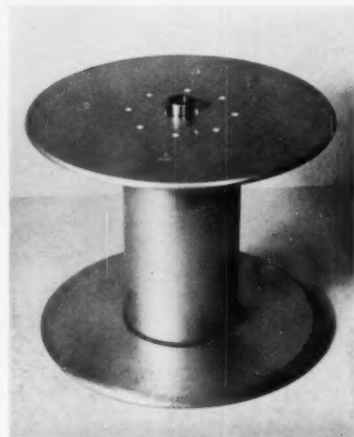


#### Shirring and Overseaming Unit

The Merrow Machine Co. has introduced a model of its Class M machines which permits intermittent or continuous shirring simultaneously with overseaming. Designated the Style M-3DW-SI, the model is reported to have the same operating advantages as other Class M machines, including automatic lubrication, ease of thread-

ing, higher speed operation, positive stitch control, and low maintenance. Handling of both shirring and overseaming in one operation, the company states, results in substantial time saving plus a much neater job.

For further information write the editors.



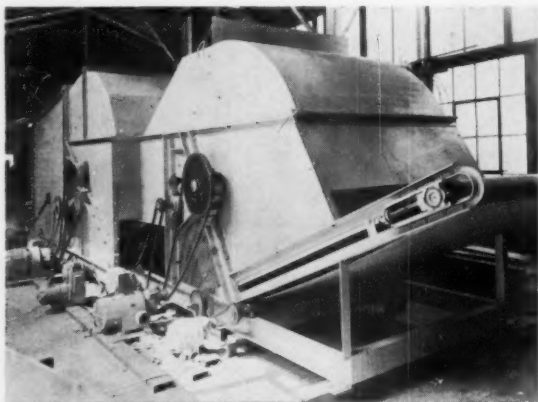
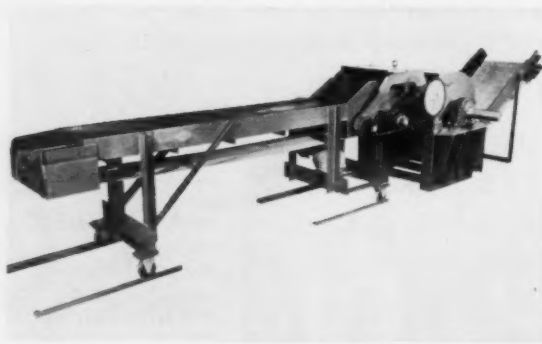
#### Better Bobbin

A new aluminum take-up bobbin recently introduced by Allentown Bobbin Works features aluminum barrel and heads brazed together and anodized against corrosion. The manufacturer reports this results in a strong, single unit without joints, cracks, or crevices where yarn can be trapped. The bobbin is available in several sizes. For further information write the editors.

#### Speed Drive Catalog

Dayton Rubber Co., now has available for distribution an eight-page, two-color catalog listing complete data for the selection of drives designed to accommodate Dayton's 2, R and W cross-section variable speed cog belts. Such drives are said to be especially suitable on spinning frames in textile mills. The catalog also features Dayton's easy-slide motor base which permits quick release of belt tension for making speed changes. For further information write the editors.

Taylor-Stiles Pivoted Arm Feed Rag Cutter and (Right) Rag Bale Opener-Feeder



A section of the assembling department at the modernized plant of Denman Textile Rubber Co., Cuyahoga Falls, Ohio.



## Denman plant modernized

By the Editors

**D**ENMAN TEXTILE RUBBER Co., manufacturer of pickers and other loom parts, has completed the rebuilding and modernization of its recently acquired plant in Cuyahoga Falls, Ohio, according to an announcement by Wilson B. McCandless, president.

Carried out at a cost of \$150,000, the program of re-equipping the plant has resulted in installation of new machinery including new presses, new high pressure, high temperature vulcanizers, new precision building machines, and new trimming and finishing equipment.

As part of the plant modernization, a fully equipped laboratory has been installed, according to McCandless, to conduct pioneering research for im-

proving the company's pickers and other loom parts. Equipment for the laboratory includes a modern high speed loom which is operated at faster speeds than ordinarily used in fabric manufacturing in order to impose stringent tests on the company's loom parts.

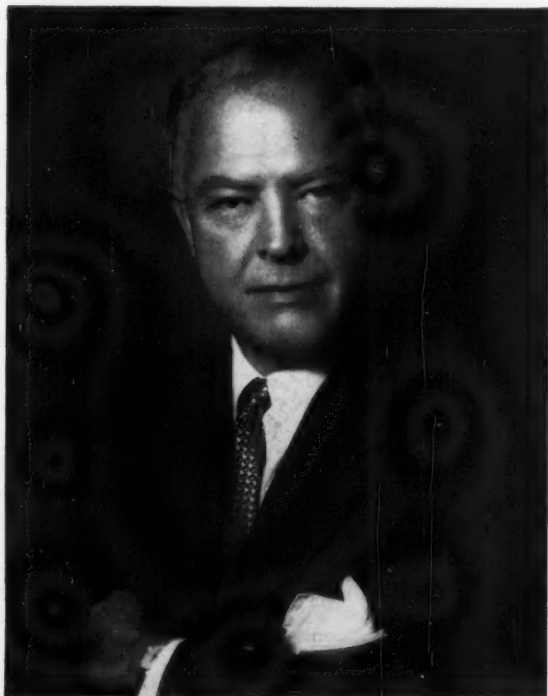
Denman's laboratory and research program is in charge of John R. Christie, a well-known rubber chemist. Christie, a graduate of Massachusetts Institute of Technology, previously worked for many years for Mohawk Rubber Co., Akron, Ohio. On invitation, he has given courses in rubber chemistry and technology to chemists of the Du Pont Co.

In addition to its laboratory research, Denman, under Christie's direction, is carrying out a research and development program in which Denman pickers and other loom parts are tested under actual mill operating conditions. A number of mills, producing a variety of fabrics, are cooperating in the program whose basic aim is the collection of performance data that will lead to development of longer wearing loom parts.

Also under Christie's direction, the company is approaching completion of a research program leading to a new heavy duty picker intended to withstand the service of new, heavier plastic shuttles coming into use. Under development also at the Cuyahoga Falls plant are light colored pickers designed to eliminate yarn discoloration from picker dust.

Manufacturing at the Denman plant is under the supervision of John Brown, superintendent of production. Brown has been associated with the Denman company for more than 25 years, and is credited with many basic inventions in the field of rubberized pickers. As part of the modernization of the Cuyahoga Falls plant, Denman has installed an improved and widened system of quality control to insure a uniformly high quality of pickers and other products.

Officers of Denman Textile Rubber Co., in addition to Mr. McCandless, are Gene Tunney, chairman of the board, R. E. Little, secretary, and Donald Slater, treasurer. The company is represented by sales agents throughout the country and abroad. ■



Wilson B. McCandless, president of  
Denman Textile Rubber Co.





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## NEW FABRICS

## NEW YARNS

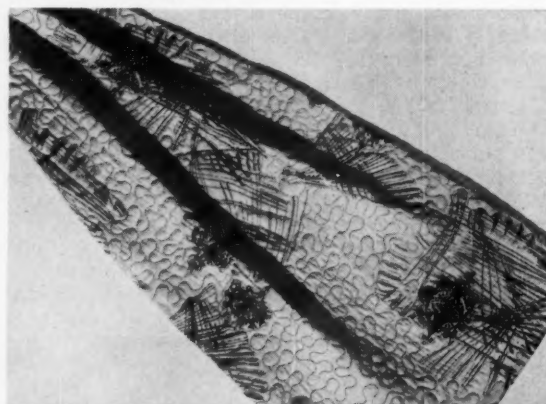
### Polyethylene Fabrics

Inexpensive draperies and tablecloths for everyday use with colors and textures said to rival those of rich brocade or fine damask, are being produced from a durable film made of Bakelite polyethylene. In contrast to the heavy dust-catching brocade, or delicate, easily stained damask they simulate, these new film fabrics are reported to be lightweight, resistant to dust and water, and easy to clean. Hartford Textile Corp., New York City, by improved techniques of embossing and inlay printing, has been able to produce the colorful polyethylene fabrics in a single process at high speeds.

### Cotton-Viscose Chenille

A long-wearing upholstery chenille called Oruga has been created by designer Arthur Brill, from a blend of cotton and viscose, for the Stead and Miller flat woven upholstery division of Collins & Aikman. Colors are unusually clean and sharp and a unique nubbing effect is obtained through use of seed yarns and barely perceptible use of gold and silver metallic yarns.

### New Metlon Mylar Uses



Metlon Corp., New York, reports new uses for Metlon H.T. (high tenacity) Mylar (Du Pont's polyester film) in embroidering, quilting and stitching. The strength of the new yarn is said to make it ideal for these applications.

### New Washable Raincoat

Lamm Brothers, Inc., is introducing a raincoat for summer that can be washed and dried in modern automatic home-laundry equipment and be ready for wear within an hour, according to Du Pont. The raincoat, called the "Clouday," has a shell fabric of 65 percent Dacron polyester fiber blended with cotton, a yoke lining of Du Pont nylon taffeta in a printed paisley design, and is treated with Zelan water repellent.

### Rayon Fire Hose

A new fire hose containing Fortisan-36, a high strength rayon product of Celanese Corp. of America, has been listed by Underwriters' Laboratories, Inc., Chicago. In tests the hose is reported to have held up successfully under water soaking followed by exposure to freezing temperature, prolonged retention in a tightly folded position at elevated temperature, and exposure to internal hydraulic pressure impulses, to flexing and to abrasion.





## TDI Stages Show at Shawnee

At the tenth annual golf tournament of the Textile Distributors Institute held last month at Shawnee Inn, Shawnee-on-Delaware, Pa., 293 members and guests participated in the three-day affair. The high point of the outing was the staging on the night of June 12 of the customary musical comedy satirizing, all in fun, the current state of affairs in the man-made fibers industry.

The show was entitled "Sheer Grab-A-Dream" (sheer gabardine) and was produced and directed by Bud Schlesinger of Chemstrand Corp. The stage manager was Donald F. Holmes of the DuPont Co., with music by Eddie Weber and Tommy Cullen. Others who helped in its preparation were Arthur Horn, Scheuer & Co.; Standish W. Holmes, American Enka Corp.; Lon Nave, American Bemberg; Edgar L. Schlesinger, United Merchants & Manufacturers, Inc.

Among the cast were Walter E. Scholer, American Viscose Corp.; Daniel Barnett, Cohn-Hall-Marx Co.; Louis J. Brenner, Shirley Fabrics Corp.; Joseph E. Carvin, Eastman Chemical Products Inc.; Joseph A. Dallas, Du Pont; Hy Goldstein, Regency Textiles, Inc.; George Greenspan, the Cantor-Greenspan Co., Inc.; Amos Griffin, Eastman; William E. IX, Jr., Frank IX & Sons; James Lederer, Burlington Industries; Edmon G. Luke, Amerotron Corp.; William G. Luttge, Chemstrand; Bruce F. Roberts, Eastman; Herbert Robbins, Cohn-Hall-Marx; Walter Ross, Rosewood Fabrics, Inc.; Robert E. Smith, Chemstrand; Kenneth Sutherland, J. P. Stevens & Co., Inc.; Truman C. Welling, Du Pont.

## Sample Cut Charge Now Widespread

A recent survey shows that a substantial number of leading fabric distributors whose aggregate volume of business exceeds \$100 million per year are now invoicing their customers an additional charge of ten cents a yard on sample cuts under 15 yards, with a covering statement to that effect on their invoices.

As reported here earlier (MTM, April, '57 p. 65 and MTM May '57 p. 67) the movement to charge for sample cuts was given impetus by one large fabric house which estimated that its actual cost for furnishing sample cuts was about 25 cents a yard for a four yard cut.

## Flammability Guarantees Expiring

Continuing guarantees under the Flammable Fabrics Act filed with the Federal Trade Commission when the Act became effective in 1954 will soon expire, it is pointed out by Miss Hilda A. Wiedenfeld, Executive Secretary of the Textile Distributors Institute.

Textile distributors and others who filed such continuing guarantees are advised to check the date of their present guarantee and be ready to mail a new guarantee before the expiration of three years from the date of the present document. Two fully executed copies each signed and acknowledged before a notary public, must be filed with the commission. A third copy can be retained for the filer's records. Forms for the guarantee can be obtained by contacting Miss Wiedenfeld at the TDI's office at 469 Seventh Ave., New York City.

## Outlook (Continued from Page 32)

**Special Quality Products**—It has been customary, in the industrial textile field, to spend great time and effort in developing fabrics to meet special requirements. There is now a tendency to do the same thing for consumer type products.

This is one of the great advantages of synthetic materials. The producer can vary the denier, the length if the fiber is in staple form, and even the physical and chemical properties of the fiber if this is necessary to meet special end requirements. Filament yarns are now also subject to modification, which preserves some of the desirable filament characteristics but imparts new qualities not previously available in filament yarns.

This trend toward specialization of raw materials is highly important from the viewpoint of future sales. Nevertheless it creates some problems for the mill, which must be increasingly prepared to handle a wide variety of raw materials. As these trends continue, certain developments can be expected.

1. Finishing requirements will tend to become more critical in view of the increased variety of textile raw materials.

2. The yarn specialist, who can spin a wide variety

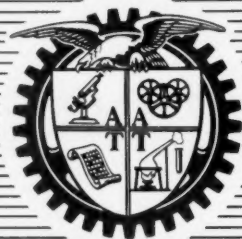
of staple fiber, or who can modify filament yarns, will become a more important factor.

## Europe (Continued from Page 45)

**Swedish Textile Demand**—Textilraadet (the Swedish Textile Council) expected home demand to rise from the equivalent of \$700 million in 1956 to \$1 billion in 1960. Sweden's high living standards, which have brought about a rise in per capita textile consumption from 17 pounds in the mid-1930s to 27 pounds at present, would probably invite serious import competition, the council warns. High technical standards and quality will have to be the answer.

**Italy Readies Polypropylene**—Montecatini is scheduled soon to start commercial production of polypropylene at its Ferrara plant. It will be called Moplen. Both the U. S. and Japan are said to be seeking production licenses. The new fiber is said to be unusually light—compared with earlier Montecatini fiber which was on the heavy side. Snia Viscosa showed a good 1956 report due to an increase of 24% in rayon staple production. Merinova (protein fiber, formerly known as Lanital) output was up 12%. Snia has nearly 70% of Italy's rayon and man-made fiber output.

# PAPERS OF THE AMERICAN ASSOCIATION FOR TEXTILE TECHNOLOGY INC.®



## AATT

## New and durable ANTISTATIC FINISHES

By Emery I. Valko and Giuliana C. Tesoro



Giuliana C. Tesoro

Dr. Tesoro, (Mrs. Victor Tesoro in private life) a native of Venice, Italy, received her Ph.D. degree from Yale University in 1943. After working for one year as a research chemist with American Cyanamid, she joined the staff of the Onyx Oil & Chemical Co. Later she became head of the Organic Research Department, and in 1955 was appointed to her present position as Assistant Director of Research.

Dr. Tesoro published several technical papers, and is the inventor or co-inventor of several patents. She is a member of the Society of Sigma Xi, of the American Chemical Society, and the New York Academy of Sciences.

**E**VER SINCE Adam and Eve reached for the leaf of the fig tree, consumers' reaction to new clothing materials was one of ready acceptance. The command of fashion to strive after something new and different made the public favorably disposed toward innovations. The first man-made fiber produced from nitrocellulose was flammable and the first rayon marketed had such a low wet-strength that it almost disintegrated in water, but they were used.

No such hardship was imposed on the consumer by the introduction of the first synthetic fiber, nylon nor by the other synthetics which followed such as the vinyls, the acrylics, the polyesters. All these fibers offered excellent shape retention in wear and through laundering and some of them also offered superior strength and resistance to abrasion. One shortcoming

however is common to all of these fibers: the tendency to accumulate electrical charges. This tendency causes difficulties in the textile manufacturing process e.g. by ballooning of yarns, attraction of dust, curling of fabrics, and it also causes discomfort, sometimes even hazard to the consumer. Clinging of garments, especially of undergarments is the most obvious discomfort. Attraction of lint and dirt is another one. Crackling sounds, when removing a slip or shirt are only slightly amusing, but electric sparks can become a deadly hazard when generated at the operating table where the patient is lying under a blanket of an explosive mixture of ether and oxygen or in a chemical plant processing flammable and explosive gases and vapors. Electric shocks can vary in intensity from amusing to annoying and from annoying to dangerous as they are generated by walking over a carpet and touching a metallic door knob.

Dr. Valko, a native of Hungary, received his Ph.D. from the University of Vienna in 1926. After a few years of research and teaching in Vienna as a member of university staff, he joined I. G. Farben at their Central Research Laboratory and remained there for ten years. In 1939 Dr. Valko came over to join the Onyx Oil and Chemical Co. as a research chemist. In 1946 he became Director of Research of E. F. Drew & Co. From 1949 to 1954, Dr. Valko was an independent research consultant to the chemical, textile, and cosmetic industries, and at the same time was connected with the Polytechnical Institute of Brooklyn. In 1954, Dr. Valko rejoined Onyx in his present capacity as Director of Research. Dr. Valko is the author or co-author of more than 40 technical papers and several books.



Emery I. Valko

Paper presented at June 5 meeting of The American Association for Textile Technology.

The tendency of synthetic fibers to accumulate static has been successfully combatted in textile processing plants and there was no lack in effort to eliminate it in the consumers' goods, fabrics and garments, by applying chemical finishes. The development of a suitable finish proved to be a difficult task. We would like to report now on the development of a new durable antistatic finish which answers the need for efficient protection of garments against the accumulation of electrical charges. Such a need is beyond doubt, but until now the advantages offered by the synthetics overshadowed whatever shortcomings they had. We believe that as soon as the consumer will learn that these shortcomings can be eliminated, the need for a durable antistatic finish will become a demand.

### What is "Static"?

Static electricity, briefly "static", the phenomenon of a body being electrically charged, is the basic phenomenon of nature from which our whole science and technology of electricity evolved. Some 2500 years ago Thales of Miletus, statesman, mathematician, and early representative of natural science, famed as one of the seven wise men of Greece, observed that amber obtained the property to attract small particles when rubbed with animal fur. Amber is a fossile resin, used by the ancient world for the manufacture of jewelry.

More than 2000 years after Thales' discovery, a systematic study of the phenomenon was begun, and at that time the name "electricity" was coined from "electron," the Greek word for amber. In 1785 Benjamin Franklin, statesman and scientist, reported to the Literary and Philosophical Society of Manchester:

"... An electrified body left in the room for some time will be covered more with dust than other bodies in the same room not electrified, which dust seems to be attracted from the circumambient air ..."

Amber is essentially a natural polyester resin. Thus, if you wear a Dacron undergarment and a woolen suit, you repeat Thales' classic experiment with each step, or movement of your body: the rubbing of a polyester resin with animal hair. The result is the same: the polyester body becomes electrically charged.

How is static electricity generated? Matter consists of positive and negative electrical charges. The nucleus of the atoms contain positive charges which are balanced by the negative charges of the electrons rotating around the nucleus. When a body is electrically neutral, it contains an equal number of positive and negative charges. If two such bodies are brought into contact some of the electrical charges cross the boundary and when the bodies are disconnected some of these charges remain separated from the body they originally belonged to. Thus one of the bodies becomes positively charged and the other negatively charged to the same extent.

The phenomenon of generation of charges by contact or rubbing is more frequent than is generally assumed. Usually, however, the charge is dissipated. This happens, when the bodies are electrical conductors, i.e. they allow the rapid flow of electricity. Insulators have a tendency to accumulate static electricity, not because they are more apt to generate charges than conductors, but because they are slower in dissipating them.

Fig. 2—Moisture Content of Cotton as a Function of Relative Humidity  
(Urquhart and Williams)<sup>2</sup>

### Why Synthetic Fibers Accumulate Static?

Synthetic fibers have a higher tendency to accumulate electrical charges than natural fibers because their electrical conductivity is lower, i.e. their resistivity is higher than that of natural fibers. This, in turn, is due to the fact that the moisture regain of synthetic fibers is lower than that of natural fibers, in other words, that natural fibers are more hygroscopic than synthetics.

When bone dry, natural fibers are poor conductors.

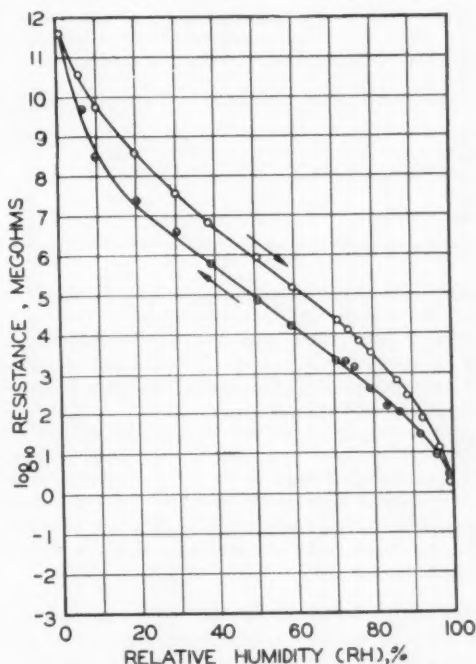
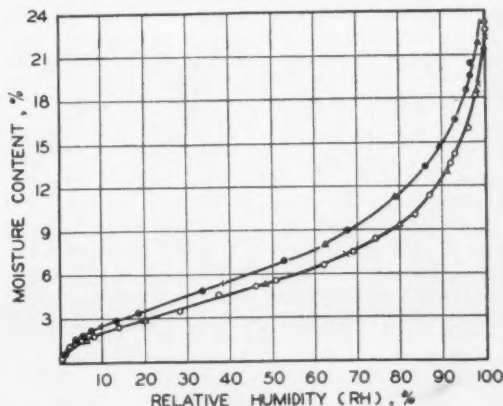


Fig. 1—Electrical Resistance of Cotton as a Function of Relative Humidity  
(Murphy and Walker)<sup>1</sup>

Figure 1 shows a chart taken from the literature. It illustrates the change in the electrical resistivity of cotton with relative humidity, going first from the bone dry state to an atmosphere saturated with water and then again back to the dry state. Since the scale for resistivity is logarithmic, it means that by merely changing the relative humidity with which the fibers are in equilibrium the resistivity can be varied in a ratio of 1 to 100 billion. Even between 20% and 80% relative humidity, variations which are quite frequent in a laboratory in New York City, the variation of resistivity is 1:100,000. Obviously, the pure fiber-substance of natural fibers such as cellulose is just as bad a conductor as that of the synthetic fibers. It is the moisture content which makes the difference. Figure 2 shows the moisture content of cotton as a





function of relative humidity. Whereas natural fibers take up a considerable amount of moisture from the atmosphere, synthetic fibers take up much less. Table I shows some representative values for the electrical

**TABLE I**  
**Resistance and Moisture Regain of Fibres at 65% r.h.**

Fiber	Resistivity in log ohm cm	Regain in per cent
Rayon	7	12
Cotton	7	8
Acetate	12	6
Polyamide	12	4
Polyacrylic	14	1
Polyester	14	0.4
Polyvinyl	15	0

resistance and the moisture regain of various fibers. We see that nylon, the least hydrophobic among the synthetics listed, has a regain of 4%. Cotton has 4% regain at about 25% r.h. and at that state its resistance is approximately  $10^{12}$  ohms, quite close to that of the polyamide at 65% r.h.

As you know, the low moisture regain of the synthetic fibers, or their hydrophobic nature is responsible for their shape retention in moist atmosphere and in water. Cotton and rayon lose their shape because they are plasticized by moisture. Hydrophobicity is a boon for shape retention and a bane when it comes to static accumulation.

#### **Blueprint for an Antistatic Finish**

In order to eliminate the tendency of synthetic fibers to accumulate electric charges, two ways seem open: either their tendency to generate charges must be suppressed or their tendency to hold the charges must be reduced. At the outset of our project we decided to pursue the second way: to increase the conductivity of the fibers so that they can rapidly dissipate charges. This decision was based on the following considerations:

1) The correlation between resistivity and tendency to static is close enough to indicate that differences in generation are not an important factor.

2) Generation of charges is probably dependent on the ultimate or mono-molecular surface layer. Due to the unavoidable contamination of surfaces, a control of the ultimate surface layer appears practically hopeless.

This decision had a twofold significance for our work. It dictated the determination of resistance as yardstick for antistatic protection and it directed our efforts to the single objective of reducing the resistivity of synthetics to the range shown by natural fibers such as cotton under identical atmospheric conditions. Again, two possibilities appeared open: either to make the whole fiber mass conductant, or to cover it with a conductant layer. The first would amount to the development of a new fiber, which would be not hydrophobic and, probably, not shape-retentive. Thus the second was chosen. A metallic layer would offer excellent protection against static but, in order to be effective, it would have to be so thick as to lend the optical and tactile characteristics of a metallic fiber. Except for metals, only water soluble liquids, among them aqueous solutions possess sufficiently high conductivity. Pure water is a rather

weak conductor. In order to be a good conductor, water must contain ionizable compounds.

The problem we faced can be formulated as follows: to surround the fibers with a hygroscopic layer containing a high concentration of ions. This task would not in itself be difficult. There are in fact more than a hundred compounds listed as antistatic agents. To be useful as a durable antistatic finish, however, the hygroscopic layer containing a high concentration of ions must be insoluble and thus withstand repeated launderings and dry cleanings.

At first sight such requirements appear contradictory. Hygroscopic compounds are usually water soluble, and moreover, insoluble compounds are known to be incapable of providing the ions necessary to increase the conductance. It is not surprising that some workers turned away from the problem of a durable antistatic finish considering it hopeless. Fortunately, it was not. Polymer chemistry which gave us the synthetic fibers, provides the solution. Polymeric molecules can be made completely insoluble while remaining hygroscopic. Polymeric electrolytes (polyelectrolytes) can be made insoluble and still be capable of providing ions to increase the conductance. Let us briefly explain the mechanism by which this can be done.

As long as the chains of polymer molecules grow from smaller units by adding new links at the two ends, they remain linear and soluble. As soon as the units combine on three or more junction points, an insoluble three-dimensional network of one giant molecule is formed. This is the mechanism by which thermosetting resins such as urea-formaldehyde are insolubilized, and natural rubber is vulcanized. When hygroscopic water-soluble molecules are cross-linked by such a mechanism, the resulting resin is insoluble but still hygroscopic. Furthermore, when a polyelectrolyte forms a network by such a cross-linking process, the resulting resin is capable of splitting off ions which contribute to the conductivity of the aqueous medium. This behavior of polyelectrolytes is very different from the behavior of ordinary electrolytes and it enables us to surround hydrophobic fibers with a hygroscopic, ionizing layer of insoluble resin.

#### **What the Antistatic Finish should Not Do**

The foregoing considerations form the basis of a blueprint for a durable antistatic finish. There are innumerable possibilities for synthesizing compounds within the frame-work of this blueprint. Our first experiments, more than two years ago, immediately proved the soundness of the concept. It was comparatively easy to find compounds which gave the antistatic effect but it was not quite so easy to find compounds which would not give objectionable effects in addition. Among the most important of these "don'ts" are the following:

The compound should not be removed from the fabric by mechanical or chemical breakdown, particularly in laundering and dry cleaning.

It should not discolor the fabric.

It should not impart an undesirable hand.

It should not require impractical application conditions.

It should not be so expensive as to become uneconomical.

In order to fulfill these requirements, it was necessary to embark on a selective breeding of polymeric families by chemical synthesis. The result of this work is "Aston".



### Performance of Antistatic Finishes

While there are many chemical compounds which fit the description of "hygroscopic polyelectrolytes", our discussion will be confined to those compounds which have proven their efficiency of performance and usefulness in practical terms. Our discussion will be limited to two products, specifically Aston LT\* and Aston 108\*. These products are similar, but differ sufficiently in terms of molecular structure and functional groups, to exhibit different performance and properties. They are water soluble polymers, applied from an aqueous solution in combination with a curing agent, which has been occasionally referred to as "catalyst", but which is actually a reagent designed to cross-link and render insoluble the soluble polymer during curing. Thus, when a fabric is padded with an aqueous solution containing Aston and the crosslinking agent, dried and cured, an insoluble resin is formed on the fabric. The conditions suggested for the application of these antistatic finishes are similar to those used for other thermo-setting resins, such as the urea-formaldehyde type. The chemical structure of our products, however, bears no relation to that of known textile finishing compounds, durable or otherwise. The details of the structure cannot be reported at this time, but it can be stated that the cured compounds are nitrogenous anion exchange resins. The durability of these finishes to washing far exceeds that of any other known chemical finish for textiles. This statement, as in the case of other durable finishes, implies a definition of durability as durability of effect. If the amount of resin remaining on the cloth after a large number of washings is measured, it is found to be only a small fraction of that originally applied, but this amount is still sufficient to provide the necessary level of performance.

The durability rating of the products has been based on the following considerations:

1) Conductance measurements after a given number of washings can be taken as a measure of performance. Bench marks have been arbitrarily set, in order to make it possible to rate the performance as acceptable or unacceptable. Cotton, a fiber showing no tendency to static accumulation, has been taken as the standard of satisfactory performance. A treated fabric showing higher conductance (or lower resistance) than cotton has been rated as excellent. A specific area resistance of  $5 \times 10^{10}$  ohms at 25% r.h. has been arbitrarily chosen as the limit beyond which the performance is considered as inadequate.

2) The durability of a given finishing treatment can be established by simply washing a swatch in a washing machine at (140°F. for 40 minutes with Tide) and measuring conductance between washings.

3) The use of accelerated washing (standard AATCC procedure) was investigated, and found satisfactory only as a relative measure of performance. A satisfactory correlation of the effect of accelerated washing with the effect of ordinary washing cannot be established, apparently due to the effect of the steel balls on the finish. This can be shown by staining the resin remaining on treated fabrics which have been washed by different procedures. The skittery appearance of the dyed resin film after one and two accelerated washes shows the uneven distribution of the finish, while for a treated fabric washed 10 times by standard methods, the dyeing shows a comparatively uniform film of residual resin.

\* Manufactured by Onyx Oil & Chemical Company.

Apparently, the brutal beating of the fabric by the steel balls in the accelerated process introduces (or at least emphasizes) a macroscopic non-uniformity of the wear-off of the resin which does not occur in the regular test or actual practice. This observation might be significant for all surface finishes and we confirmed it for a commercial pigment printed fabric.

4) Resin retention studies were carried out by two methods: by weight difference, and by a staining technique. The weight difference method was used for determining the amount of resin removed by rinsing or, in other words, the effectiveness of the curing step. The staining method was found more practical for determining the amount of resin remaining on a fabric after washing. The correlation of conductance with amount of residual resin is shown in Figure 3. In this graph, the amount of

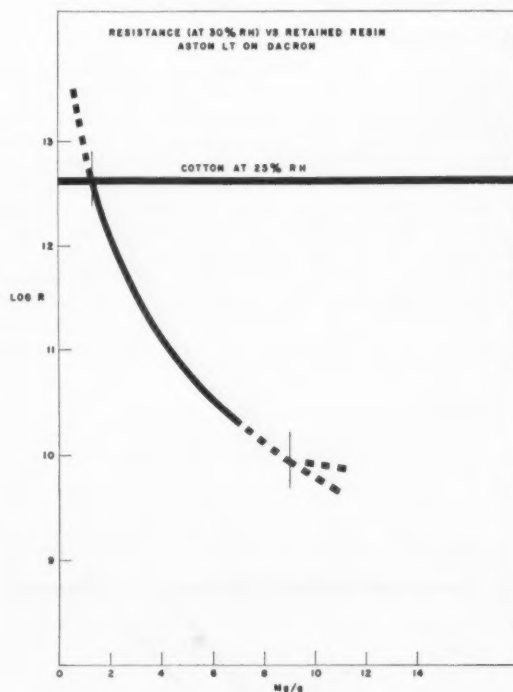


Fig. 3

residual resin (in mg/g owf) is plotted against the log of resistance. Resistance measurements in the range of  $2 \times 10^{10}$  to  $5 \times 10^{12}$  ohms are accurate, and fall on the solid line. The dotted line portions of the curve should be regarded as approximations, since the equipment used was not adjusted to determine accurately resistances lower than  $2 \times 10^{10}$  or higher than  $5 \times 10^{12}$ .

The application of Aston LT and Aston 108 is carried out from aqueous solution and the concentration of the solution is chosen to give a dry add-on on the cloth varying between 0.5 and 3%, depending on the desired results. The chemical nature of the fiber, the color requirements, and the intended end use are factors which must be considered when the amount and mode of application of the products are selected. Generally speaking, if 2% Aston is applied to a fabric woven from any synthetic fiber, and the fabric is dried at 210°F., cured 3 min. at 300° and rinsed, the finish obtained will be durable to 20-80 machine launderings at 140°. Within this range, the

durability depends on a number of factors which will be examined one by one. By proper selection of these factors, almost any level of durability can be achieved.

#### FACTORS INFLUENCING DURABILITY

The factors influencing durability of Aston LT and Aston 108 are the following:

- Nature of the fiber
- Construction of the fabric
- Amount applied (solids on wt. of fabric)
- Ratio of Aston to cross-linking agent
- pH of the bath
- Effectiveness of the curing step.

Many of these factors are inter-related and should not be varied independently of each other; but for the purpose of investigating their importance it is essential to consider them as individual variables. The effect of these variables can be judged only under conditions which leave all other factors constant.

#### Effect of Fiber

While there is probably no chemical interaction between the antistatic finish and the fiber, the nature of the fiber has a very definite effect upon the durability of the resin. In the course of our work, it was observed for instance that some products were durable on Dacron and not on nylon, others were durable on acrylic fibers only. This specificity is perhaps surprising, and certainly not fully understood. Aston LT happens to be less specific in its effect than any other durable antistatic finish we studied, experimental or commercial. It is effective on all synthetic fibers, but still, its effectiveness varies somewhat depending on the chemical nature of the fiber. Aston 108 is more specific than Aston LT.

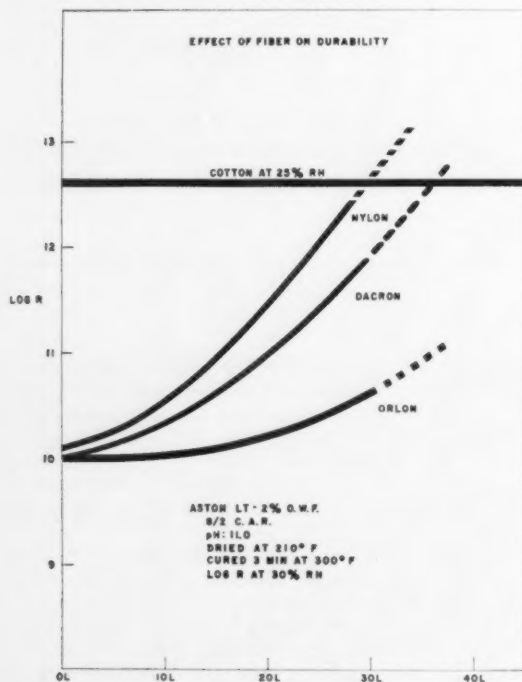


Fig. 4

Figure 4 represents applications of Aston LT which were carried out under identical conditions on Dacron, nylon and Orlon fabrics of similar construction. By plotting resistance against number of laun-

derings for each fiber, the relative position of the curves obtained indicates the effect of fiber upon durability. The results show that the durability is greater on Orlon fabric than on Dacron and that the durability on Dacron in turn is greater than on nylon.

These differences may be caused either by an unknown effect of the fiber upon the efficiency of the curing step, or on differences in the forces binding the Aston film to different fibers, or on both of these factors. It was found that the amount of insoluble resin formed at a given time and temperature is different for different fibers. Surprising as this observation is, it indicates an effect of the fiber on the extent of cross-linking during curing. On the other hand, different fibers on which the same amount of insoluble resin was deposited by suitable adjustments in application conditions, retained different percentages of the resin after the same number of washings. These facts would indicate that both factors contribute to the differences observed.

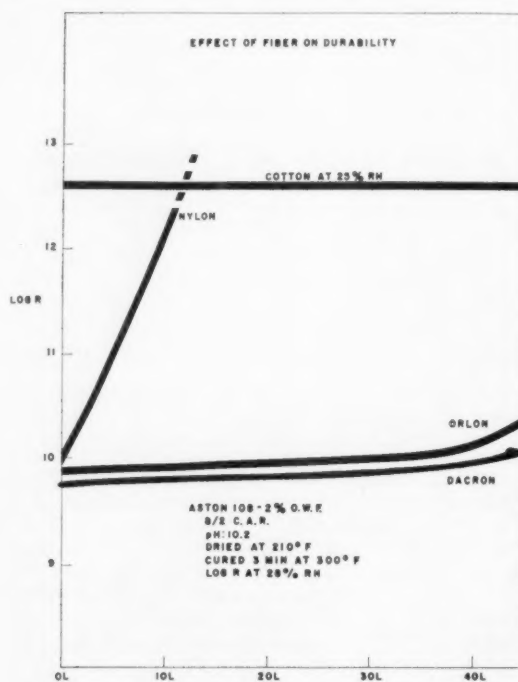


Fig. 5

The differences are greater with Aston 108 than with Aston LT. Figure 5 shows the wide difference in durability observed with Aston 108 on Dacron and Orlon on one hand, and nylon on the other.

#### Effect of Fabric Construction

The effect of fabric construction on durability is extremely important. Woven fabrics give better results than knitted fabrics. Heavy fabrics give better results than sheer fabrics. When the durability of identical treatments on woven and knitted Dacron or on woven and knitted nylon is compared, a significant difference which can be attributed largely to construction is observed. Similarly, spun fabrics give better results than filament fabrics. It is not easy to represent these differences in quantitative terms and no attempt will be made to do so. On the basis of experience, application conditions can be selected in such a manner as to compensate largely for these dif-

ferences, and satisfactory durability can be achieved on all types of fabric.

### Effect of Amount Applied

The effect of the amount of resin applied on the durability of the finish can be expressed in quantitative terms. If all other conditions are constant (fiber, construction, ratio of cross-linking agent, pH, curing time and temperature), the durability increases with the amount of resin applied. A portion of the finish is removed with each laundering, and the conductance of the treated fabric drops below the acceptable level if the amount of resin remaining on the fabric drops below the minimum. The results obtained on application of 0.5%, 1.0%, and 2.0% Aston 108 to Dacron under identical conditions are shown in Figure 6. Tentatively, it can be stated that durability

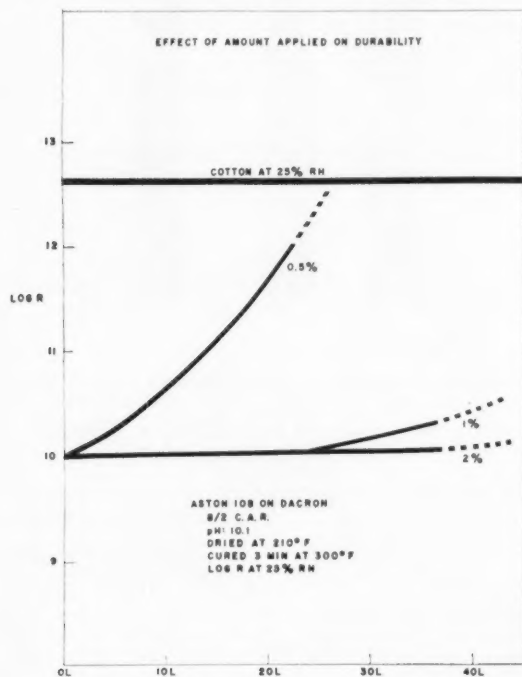


Fig. 6

varies linearly with the amount of resin applied, and this is illustrated in Fig 7, where the amount of resin applied is plotted against the number of laundings required to reach a value of log R greater than 12.8 at 30% r.h.

This linear relationship holds only within certain limits, tentatively set at 0.5% to 4%. Since the finish surrounds the yarns and fibers, it is possible to visualize a point beyond which all interstices are filled, and additional resin is deposited on the surface and readily removed. On the other hand, below a certain minimum the amount applied may be insufficient to coat evenly fibers and yarns, giving a discontinuous film. The significance of continuity cannot be over-emphasized. Schematically, when yarns or fibers are surrounded with a continuous layer of the finish, the fabric can be considered as a system of good and poor conductors placed in parallel. In this case, of course, the conductance of the system is essentially that of the good conductor. If the conductant layers are discontinuous, the fabric can be considered as a system of good and poor conductors placed in series. The conductance of such a system is essentially that of

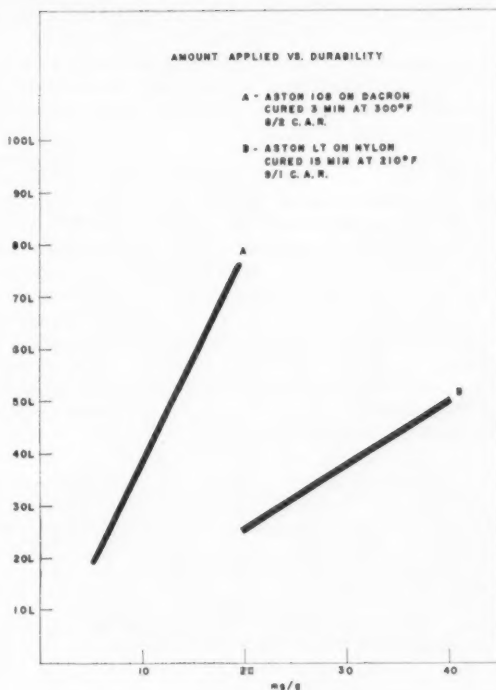


Fig. 7

the poor conductor. Thus, when the amount of resin drops below the level necessary to maintain continuity, the conductance decreases abruptly.

### Effect of Ratio of Cross-Linking Agent to Aston (C.A.R.)

It was pointed out earlier that the so-called catalyst is not a true catalyst but actually a reagent which becomes part of the resin upon curing, and which is more accurately called "cross-linking agent". If all conditions are maintained constant, the rate of formation of the insoluble polymer increases with increasing amounts of cross-linking agent. The effect of varying C.A.R. upon durability has been studied, and ratios of 9:1, 8:2, 7:3, and 6:4 (expressed as ratio of Aston to cross-linking agent solids) have been selected for this purpose. The results obtained are shown in Figure 8. 2% Aston LT was applied to

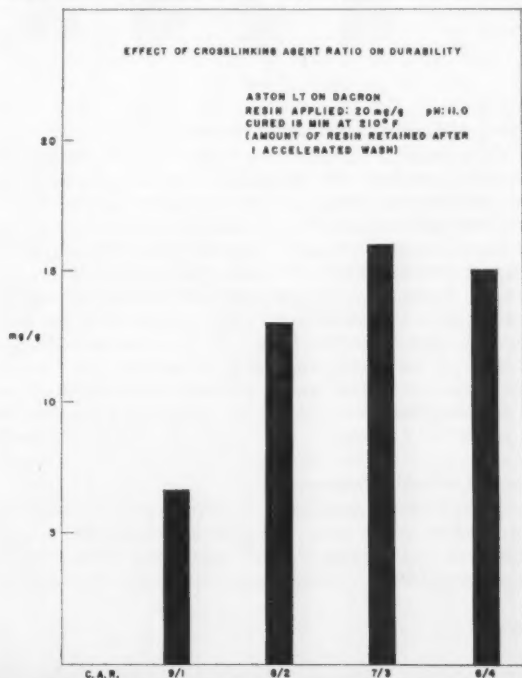


Fig. 8

Dacron, and the amount of resin remaining on the fabric after one accelerated wash was determined by a staining technique for treatments employing 9/1, 8/2, 7/3 and 6/4 C.A.R.

### Effect of pH

The reaction between the soluble polymer and the cross-linking agent takes place more readily under strongly alkaline conditions. Thus, for a given time and temperature of curing, the durability increases with increasing pH (reaching its optimum level at pH 10.5 to 11.0). Satisfactory durability can be obtained at lower pH, but not without compensating by changes in other conditions. Figure 9 shows the amount of resin retained after rinsing and after one accelerated wash for Aston LT treatments carried out at pH 8, 9, 10 and 11.

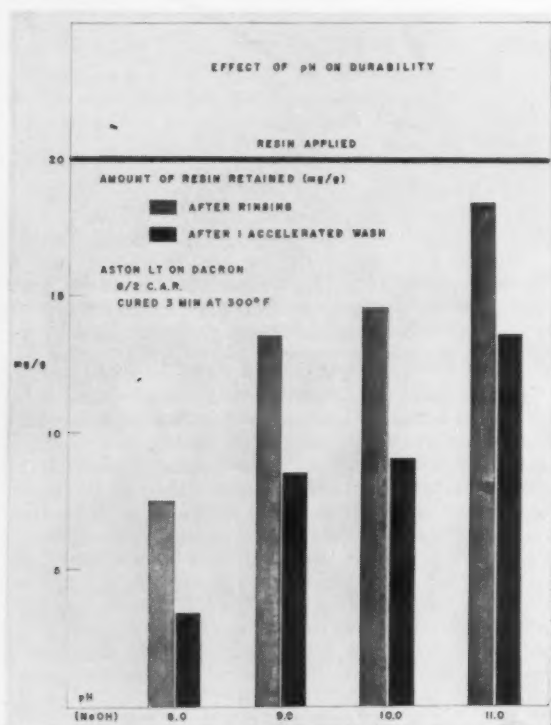


Fig. 9

### Effect of Curing Time and Temperature

Variations in the curing time and temperature greatly influence the amount of resin remaining on the fabric after rinsing. The choice of curing times and temperatures has been narrowed somewhat by practical considerations. While the normal time/temperature relationship prevails, the choice of conditions is limited by the efficiency of the curing equipment, time limitations, color requirements and similar considerations. The ultimate choice of conditions is made by carefully balancing all factors against each other, and arriving at suitable compromises. The effect of curing time and temperature on durability is shown in Figure 10 and in Table II.

### Factors which Influence Color

While the durability of Aston LT and Aston 108 can be controlled almost at will, it depends on a wise selection of all the factors discussed. Since these products show some tendency to reduce the reflect-

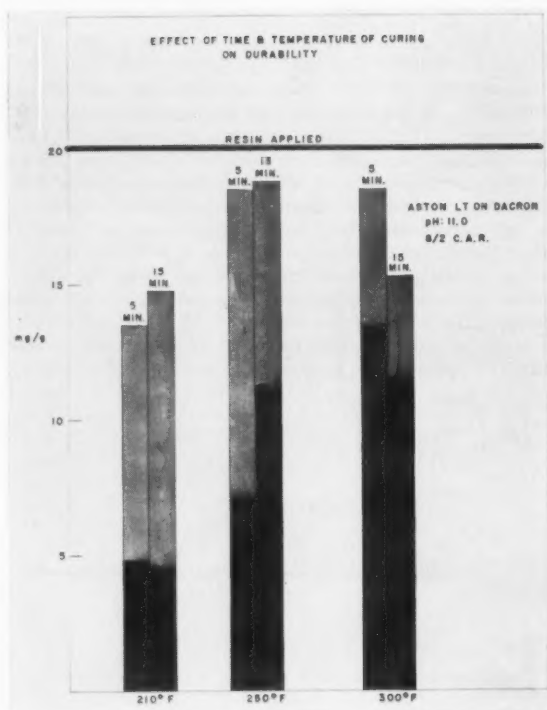


Fig. 10

TABLE II  
% of Resin Retained After Rinsing Aston 108—  
2% Applied at pH 10.2

Cured at	Nylon—6/4 C.A.R.		
	5 min.	10 min.	15 min.
210°F.	—	21	31
250°F.	21	58	74
270°F.	34	71	72
290°F.	39	63	80
Nylon—7/3 C.A.R.			
270°F.	34	55	75
290°F.	37	65	73
310°F.	—	69	78
Nylon—8/2 C.A.R.			
270°F.	19	22	22
290°F.	16	19	26
310°F.	—	20	30
Dacron—8/2 C.A.R.			
290°F.	68	65	73
310°F.	—	78	79

ance of white fabrics, it is necessary in some instances to reduce the level of durability by choosing the conditions of application in such a way as to minimize the tendency to discoloration. This tendency to discoloration is far less pronounced with Aston 108 than with Aston LT. In order to analyze the factors which affect it, it is essential to distinguish a number of separate discoloration phenomena. The initial discoloration, or discoloration on curing, is a function of the amount applied and of application conditions.

For constant curing conditions, the discoloration increases with increasing amounts applied. Reflectance measurements accurately represent the discoloration observed visually, but it is difficult to express



the loss of reflectance in quantitative terms as a function of the amount applied. The discoloration is also affected by the nature of the fiber. In a broad sense, conditions which give optimum durability also give maximum discoloration. The necessity for reaching the best compromise in application conditions is thus obvious. Excellent whites coupled with excellent durability can be obtained, especially with Aston 108, with the aid of optical bleaches.

Fabrics treated with Aston LT and with Aston 108 should not be dry cleaned in "high charge" systems. Repeated commercial dry cleaning by this procedure, which consists of dry cleaning in a system of controlled relative humidity, containing about 4% detergent, discolor the fabric and impart stiffness. While the antistatic finish is not removed, its effect is masked by an insulating deposit. Antistatic performance, color and hand can be restored by efficient washing.

#### **Effect on Other Properties of Fabrics**

The effect of Aston LT and 108 on the  
light fastness of dyes,  
gas fading properties of dyes,  
wash fastness of dyes,  
tensile strength,  
tear strength,  
abrasion resistance,

and flammability of treated fabrics was investigated for some representative fabrics and dyes by standard AATCC test procedures. No unfavorable results were obtained, except for a slight decrease in tensile strength caused by Aston 108 (measured on Dacron) and a light decrease in tear strength caused by Aston LT (measured on Arnel).

Skin irritation tests are in progress for fabrics treated with Aston, and preliminary results are fully satisfactory. The final results of these tests should be available shortly.

#### **Resistance to Bleaching**

Fabrics treated with Aston LT and Aston 108 should not be chemically bleached. Oxygen bleaches and chloride bleaches remove the antistatic finish at a rate which depends on the conditions employed. This is a limitation in terms of practical use, but at present no method is available for overcoming it.

#### **Combinations with Other Textile Finishes**

The durable antistatic finishes can be used with other textile finishes of various types, even though it is often necessary to carry out separate applications. While both durable antistatic performance and durable water repellency can be achieved, it has not been possible so far to combine the two treatments into a single application. Similarly, urea-formaldehyde resins can not be applied simultaneously with Aston, since the pH requirements for the two types of resin are widely different. The application of thermoplastic resins can be carried out with Aston and there are indications that thermo-plastic resins can even increase the durability of the treatment. Textile softeners of the cationic and non-ionic type can be conveniently applied to Aston treated fabric during the afterwash or rinse. Silicone softeners can also be used, and give excellent results on acrylic fibers.

#### **SPECIFIC APPLICATIONS**

A few among the more important applications of durable antistatic compounds in the textile industry should be mentioned.

The well-known clinging of nylon tricot undergarments is a phenomenon which does not need elucidation. Female consumers all over the world have experienced the discomfort of a wool skirt clinging tenaciously to nylon undergarments. Male observers, undoubtedly, remember noticing a sheath type dress, set in unsightly folds due to the clinging, clinging slip underlying it. The application of Aston to nylon tricot provides freedom from these shortcomings. Aston treated undergarments fall in graceful folds, do not cling to the outer garments or body, and thus combine the advantages of hydrophilic fibers with the strength, ease-of-care and crease resistance of nylon. Fabrics such as Dacron tricot, have not even been introduced for use in women's underwear probably since the extreme tendency of Dacron to accumulate electrostatic charges ruled out this use. Dacron tricot finished with Aston could well provide a new answer to the constant demand for new and better articles in the world of fashion.

More serious effects of static electricity exist in those end uses where sparks can actually endanger human lives. Applications of Aston to Dacron and Orlon show that a high level of safety from hazards of this type can be provided and maintained through those 70 or 80 launderings which the garment is likely to receive.

The tendency of fabrics containing hydrophobic fibers, such as Dacron and wool blends, Orlon and wool blends and, of course, 100% Dacron or Orlon fabrics to attract lint and dust from the atmosphere, is particularly objectionable in the case of dark colored fabrics. In this area also, the use of an effective durable antistatic finish can significantly increase the market for the fabrics.

The Astons have been successfully applied to pile fabrics. Application to the dyed staple fiber provides protection from static electricity throughout processing. Curing of the finished fabric, then fixes the antistatic protection for many dry cleanings to come. In this type of application, Aston can act as a processing aid as well as a durable finish. The amount required is small, because garments made from pile fabrics are obviously not going to be laundered 50 or 100 times. Caution should be exercised in choosing the dry cleaning method used on such garments in view of the undesirable effects of high charge dry cleaning systems on Aston treated fabrics.

The application of Aston to rugs holds great promise. With the ever increasing amount of synthetic fibers being used in floor coverings, the problem of static accumulation becomes more and more acute. The answer can probably be found in a finish which can eliminate this objectionable effect. The problem of resistance to soiling is of such great importance in the case of rugs, that only a chemical finish which resists soiling would be acceptable. The successful application of Aston in this field may have to await forthcoming developments.

Among the other applications of durable antistatic finishes which hold promise are sweaters, socks and blankets. The effects of static electricity in this type of article are less dramatic than in others. Perhaps only after they are eliminated, their full impact will be realized.

Some experiments were carried out in order to determine the effect of Aston on fabrics which contain or which are made exclusively from hydrophilic fibers. It was found that blends containing large percentages of hydrophobic fiber have a significant tendency to accumulate static charges; the performance

of the Astons on these fabrics does not differ substantially from their performance on fabrics made from 100% hydrophobic fiber. When the percentage of hydrophilic fiber is high or more generally, when the untreated fabric does not show a significant tendency to static accumulation, the use of Aston does not increase the conductance of the fabric. This is true for fabrics containing high percentages of cotton or rayon, and of course for 100% cotton or rayon.

Interesting results were obtained with some fabrics provided by the American Viscose Corp. They were: an unfinished 65/35 Dacron/rayon blend, a 65/35 Dacron/rayon blend, Avcoset finished, and a 100% rayon fabric, Avcoset finished. The first two of these showed high electrical resistance, as expected. The application of Aston LT and Aston 108 reduced the resistance below the level of an untreated 100% cotton or rayon fabric. Even after 40 launderings in a Westinghouse washing machine at 140°, the resistance of the treated fabrics was lower than that of 100% cotton. The third fabric showed a much higher resistance than that expected for a 100% rayon fabric, but the resistance of this untreated fabric after 40 launderings was greatly reduced, apparently due to removal of the Avcoset finish. Astonizing of the Avcoset finished 100% rayon reduced the initial re-

sistance below the level of unfinished 100% rayon, and the value was essentially unchanged after 40 washing cycles.

The application of Aston to 100% cotton has been only superficially investigated. The electrical resistance of cotton is not reduced by the application of Aston, and even appears to be increased.

The application of Aston to fabrics woven from glass fibers has been successfully carried out, and the resin was found to provide glass fabrics with many valuable properties in addition to the anticipated improvement in electrical properties.

Tendency to accumulate static is a serious shortcoming common to all synthetic fibers. Its elimination at consumers' level has been sought for many years. We found a practical solution of this problem by finishing the fabric with compounds belonging to a new class of polymers. Aston LT and Aston 108 have proven their usefulness in almost every application tested. We believe that the new polymers open new avenues in the field of textile finishing.

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## Autocopser parts stocked here

**A** SERVICE CENTER for Schlafhorst Autocopser quill winding machines has been established in Charlotte, N. C. by the American Schlafhorst Co. and the Terrell Machine Co., it was made known at a recent press conference in Charlotte. The announcement was made by Dr. Walter Reiners, president of the W. Schlafhorst & Co., of Gladbach, Germany, maker of the Autocopser and W. S. Terrell, vice president of the Terrell Co. and president of the American Schlafhorst Co.

It was revealed that the new service center located at the Terrell plant in Charlotte will stock all parts of the Autocopser for supplying American users of the machine on short notice. It was also announced, that in case of a national emergency or disruption of supplies from Germany, all Autocopser drawings are

held in escrow at the Terrell plant in Charlotte. They would thus be available to permit manufacture of parts in this country.

At the Charlotte service center for the Autocopser, a training school has been established for mill fixers and already more than 90 fixers have taken the two week course in Autocopser maintenance. The course is free to mills using Autocopser. Dr. Reiners stated that, since the Autocopser was first introduced in 1954, more than 2,600 spindles have been sold in the U. S. at a price of about \$500 a spindle. This is enough Autocopser spindles to service 8,000 looms.

Advantages of the Autocopser, as outlined by Dr. Reiners, are: a rotary traverse guide which makes practical spindle speeds between 10,000 and 12,000 rpm; tension and yarn control at high speed combined with a reliable mechanical performance to permit a high yield in operator output and machine efficiency; outstanding versatility for the mills using the Autocopser since each spindle winds, doffs, and stacks or pinboards independently of the other.

Dr. Reiners said that in coming months the American Schlafhorst Co. expected to step up production of Autocopser units equipped with an automatic boxing attachment for cottons, spun synthetics, woolsens and worsted yarns. This attachment "pre-positions" the quills in boxes which may be transported directly to the loom, thereby permitting substantial labor savings. For filament synthetic yarns, the Autocopser is furnished with a pinboard attachment.

Dr. Reiners pointed out that a convertible Autocopser model is available which can be arranged to use both individual boxing attachments and individual pinboard attachments thus allowing mills to follow market shifts without purchasing new equipment.

**WATCHING IT GO**—E. A. Terrell, of the Terrell Machine Co. (second from left) and Dr. Walter Reiners of the Schlafhorst Co. (third from left) watch a recent demonstration of the latest model Autocopser at the Terrell plant in Charlotte, N. C. The man farthest from the camera is W. S. Terrell, President of the American Schlafhorst Co.



## For the DYER and FINISHER

### New Poly-Tergent Series

A new "J" series has been added to the Poly-Tergent line of non-ionic surface active agents introduced earlier this year by Industrial Chemicals Division of Olin Mathieson Chemical Corp., Baltimore, Md. The "J" series is said to have a wide temperature range over which the products are effective. The series consists of four products of ascending molecular weights; all are aliphatic polyoxyethylene ether alcohols. They are reported to be good wetters, detergents and dispersants, and have a wide range of industrial uses.

### Orlon Saturation Value

Technical bulletin OR-75, issued by the Technical Service Section, Textile Fibers Department of Du Pont, Wilmington, Del., reports that the saturation value of Orlon has been increased by about 30 percent so that a greater amount of cationic or basic dye can be applied, and that the rate at which cationic dyes are absorbed is about 30 percent greater. The bulletin points out that the improved dyeability permits better results in deep shades, particularly when the highest attainable dyeing temperature is approximately 205°F.

### Dacron Dye Nets

Replacement requirements for dye nets have been reduced 50 percent since adoption of nets of Dacron polyester fiber, according to Merlin, Inc., North Bergen, N. J. The firm dyes such knit goods as sweaters, gloves, socks, dresses, suits and cloth of all synthetic fibers. Merlin purchased a large inventory of Dacron nets and started using them in February, 1955; the firm has had to replace only about 25 dozen per quarter with about 60 percent of the original nets still in use.

### Silicone Emulsions

Five leading chemical companies have been licensed to manufacture silicone emulsions for textiles and leather made with Syl-mer and Sylflex water and stain resistant finish by Dow Corning Corp., it was announced by Olin D. Blessing. The new licensees are American Cyanamid Co., Arkansas Chemical Co., Refined Products Co., Soluol Chemical Co. and Warwick Chemical Co.

Each of Dow Corning's mill and finisher customers who are licensed to apply Syl-mer, can make Syl-mer tags available from Dow Corning to their manufacturing customers. Licensing arrangements also stress the maintenance of quality control standards.

# 100% INSPECTION

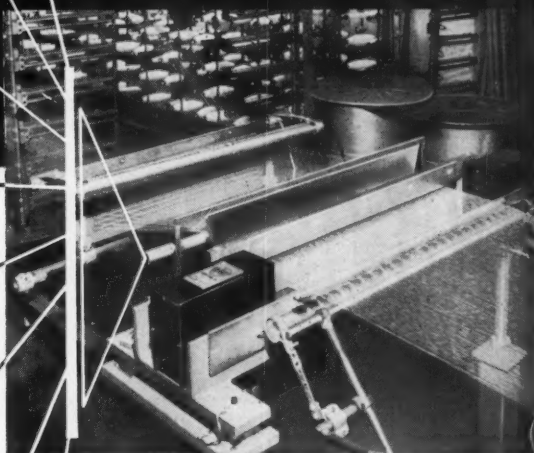
## Lindly automatic yarn inspector



guarantees the relative quality of warped yarn for warp knitted cloth or woven cloth fabrics by establishing  
**The Lindly Count.**

Accurately and economically, the Lindly Automatic Yarn Inspector detects yarn faults. Similarly, it sets up a count or stop motion on those faults that are larger than your operation will permit.

YOU DETERMINE QUALITY . . . AND YOU  
CAN STATE THAT QUALITY IN TERMS  
OF THE LINDLY COUNT.



Lindly Automatic Yarn Inspector inserted in a warping operation.

**OTHER FEATURES**—Improve quality through controlled tension during warping . . . improve quality of finished woven or warp knitted fabrics . . . assure more even dyeing.

FOR FULL INFORMATION ON THE LINDLY AUTOMATIC YARN INSPECTOR, WRITE OR CALL FOR LITERATURE . . . AND USE THE LINDLY ADVISORY SERVICES WITHOUT OBLIGATION.

*It Pays to Know The Lindly Count*



## LINDLY LINDLY & COMPANY, Inc.

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# BRIGHT

# CLEAR

# COLORS

assure added sales appeal with  
**GLOBE-DYED SYNTHETIC YARNS**

For fine hand, and superior knitting and weaving qualities, you can rely on Globe package-dyed ORLON—DACRON—NYLON—ACRILAN.

Globe does package dyeing on tubes, skein and warp dyeing and bleaching, warp mercerizing and sizing.

Yarns we process include cotton, rayon, worsted, nylon, linen, blend and novelty yarns. Also Acrilan—Dacron—Orlon.



**4500 WORTH STREET, PHILADELPHIA 24, PA.**

JEfferson 5-3301

## Fabric Protection

A simple, low-cost chemical process which is said to appreciably enhance the toughness and longevity of a wide variety of fabrics and other materials has been developed by Tee-Pak, Inc., Chicago, Ill. The new process, it is reported, can be used on many products, including cotton, rayon, burlap, canvas, rope, jute and paper. Tee-Pak plans to license the process. Acrylonitrile is the principal chemical used in the process.

## Sanitized Fabrics

The Sanitized finish, which is said to assure lasting freshness even after repeated launderings and dry-cleanings, is now available in circular knit cottons, rayons and in the woven elastic fabrics produced by Beaunit Mills. The process, reported to inhibit germ growth while retarding perspiration odors, is felt to be particularly applicable to the finished garments into which these materials are manufactured.

## Sandoz Adds New Dyes

Sandoz, Inc., New York, has introduced two new dyestuffs. The first, Lanasyn Brilliant Yellow 5GL, is for use with the firm's series of neutral dyeing premetallized dyestuffs and is recommended for formulation of bright green shades on nylon, silk and woolsens and worsteds. The second, Artisil Direct Blue Green G, is said to be the brightest bluish green of all dispersed dyes and is for use on man-made fibers. Descriptive literature concerning the new products is available from the manufacturer.

## Dual-Purpose Weighter

Arnold, Hoffman & Co., Inc., Providence, R. I., has developed what it describes as a dual-purpose product, Weighter 546. It is said to combine the characteristics of softener and weighter in one convenient, easily applied finishing agent. Weighter 546 is reported to be composed of 50 percent active ingredients readily soluble in water, and with excellent storage stability. Complete data may be obtained from the company.

## Latex Splicing Compound

A new latex splicing compound, Vulcanol adhesive, AL-1005, for joining carpet yarns made from nylon, acetate, Acrilan, viscose, cotton and wool has been announced by the Alco Oil and Chemical Corp. This adhesive is said to set uniformly and quickly, but not so rapidly as to interfere with the operator making a strong, yarn joint. The new compound is sold in two parts which are mixed just prior to use. For further information write the editors.



### New Cotton Finish

Bradford Dyeing Association (USA), New York and Bradford, R. I., has announced development of a new chlorine-resistant cotton finish, Bradperma CMI. The finish is said to offer a 100 percent "drip-dry" feature and permit use of bleaches and detergents without fear of the material turning yellow. Users may apply for the Good Housekeeping seal.

### Differential Dyeing

Details of the investigations and their results on additional uses of differential dyeing, which has been used primarily to determine maturity of cotton fibers, can be obtained free from the Southern Utilization Research and Development Division, Agricultural Research Service, U. S. Department of Agriculture, 1100 Robt. E. Lee Blvd., New Orleans 19, La.

### Geigy Green Dyestuff

A new dyestuff, Cupropheryl, Green 2BL, developed especially for cotton and rayon, has been introduced by Geigy Dyestuffs, Division of Geigy Chemical Corp., Ardsley, N. Y. The color is said to be a bluer shade with good dyeing qualities and light fastness. Anti-crease finishes are reported to have no effect on the shade. Geigy's Cupropheryl range was brought out in 1951 and has been widened since then to cover almost the entire spectrum. They are dyed as ordinary direct colors and after-treated with copper and acetic acid or other fixatives, such as Gycofix 67, to develop the true shades and fastness characteristics. The range is recommended for use on a wide range of cotton and spun rayon fabrics as well as on yarn, staple fibers and viscose cakes.

### Coning Oil Data

Nopco Chemical Co., Harrison, N. J., has issued a new technical data report, "Nopco Treatments for Yarn Lubrication," which includes the newest lubricants having strong antistatic control, and a guide for testing new coning oils. Free copies of the report may be obtained from the company.

### New Surfactants

The Marketing Research and Development Department of Tennessee Corp., Atlanta, Ga., has announced the availability of two new surfactants, Sul-Fon-Ate BL and Sul-Fon-Ate OE-300. The first is a new liquid surfactant said to exhibit high surface activity in strong alkaline medium and good surface activity in high concentrations of mineral acid. The OE-300 is a new anionic surfactant which functions as a wetting and rewetting agent. Samples and descriptive literature may be obtained from the company.



**CHECK...**

- ✓ end breakage
- ✓ waste
- ✓ work stoppage
- ✓ poor quality

## with **STANLEY** **automatic door controls**

The problems headlined above stem from changes in temperature and humidity. Opening and closing doors automatically — and permitting doors to stay open only the minimum time required to let traffic through—Stanley Magic Door Controls help keep mill temperature and humidity constant. Stanley Magic Door Controls can be installed on any new or existing doors — including fire doors — that swing, slide or fold.

**WRITE FOR YOUR FREE COPY** of "Plant Ideas to Make Efficiency Grow" to Magic Door Sales, Stanley Hardware, Division of The Stanley Works, Dept. G, 1535 Lake Street, New Britain, Conn.

*Sales and service representatives in principal cities in the United States and Canada.*

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# STANLEY

This famous trademark distinguishes over 20,000 quality products of The Stanley Works—hand and electric tools • drapery, industrial and builders hardware • door controls • aluminum windows • metal parts • coatings • steel and steel strapping—made in 24 Stanley plants in the United States, Canada, England and Germany

## WHAT HAS THE ACROPOLIS TO DO WITH HARD CHROMIUM PLATING?



The Parthenon on the  
Acropolis at Athens . . .

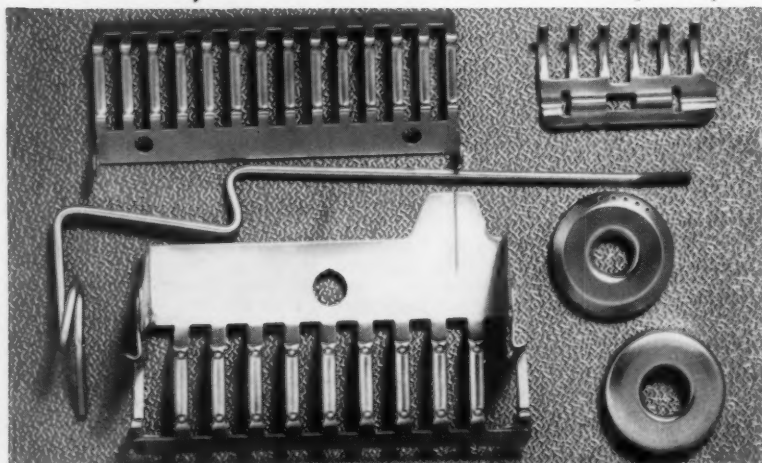
In ancient Greece each city was constructed at the base of a large hill which served as a natural stronghold against hostile neighbors. Such a city was Athens which, over 2400 years ago surrounded itself with a high wall and strengthened its citadel, known today as the famed Acropolis. Many sections of the original barricades still remain, reminding present day Athenians that their city could not have survived without the magnificent efforts of their wise ancestors, who believed that a valued possession deserved their best protection.

When it comes to longer-lasting protection for your textile parts, WALHARD Hard Chromium Plating is your answer. Outstanding workmanship and 20 years' experience exclusively on Hard Chromium back the WALHARD signature, guaranteeing you substantial savings in maintenance and down-time costs. Don't be satisfied with less than the best — Be sure you are getting quality — it costs no more and lasts longer.



*Specify* WALHARD on your next Hard Chromium Plating order for POLISHED or SATIN FINISHED textile parts.

*The leading name in textile hard chromium plating*



**WALTON and LONSBURY**

79 NORTH AVENUE — ATTLEBORO, MASSACHUSETTS



## Textile News Briefs

### Hatch Marks 31st Year

Hatch Textile Research, Inc., commercial textile testing laboratory founded in 1926, celebrated its 31st anniversary recently. The laboratory is now undergoing a modernization program to serve better its clients.

### New Celanese Distributor

Celanese Corp. of America has appointed Royal Manufacturing Co., Perth Amboy, N. J., as distributor of type F acetate staple fiber, which after processing is marketed under the trade name Celacloth. Royal will distribute the product nationally to the batting and stuffing trades in all but the 11 western states. Celacloth is reported to be odor free and non-allergenic.

Celanese also announced that Midwest district headquarters for its Textile Division has been moved to the Merchandise Mart Building, Chicago.

### Barnes Textile Relocates

Barnes Textile Associates, Inc., has coordinated its activities with those of Scovell, Wellington & Co., and relocated its Boston office at 110 State Street, according to N. M. Mitchell, president. Mr. Mitchell said his organization will continue to provide consulting engineering services to the textile industry, functioning as Barnes Textile Associates, division of Scovell, Wellington & Co.

### Dow Silicone Plant

A new Dow Corning Corp. plant for manufacturing silicone consumer products is being constructed at Greensboro, N. C. Dow also established a silicone specialties division as a separate operating unit to permit more efficient operation and provide room for expansion of the company's line. Sales and administration officials of the division will remain at the home offices of the corporation in Midland, Mich.

### Bassill Receives Degree

John E. Bassill, American Enka Corp. president, was the principal speaker and a recipient of the honorary degree, Doctor of Textiles, at the 74th commencement exercises of the Philadelphia Textile Institute, Germantown, Pa., June 8. Mr. Bassill has served as president of four major rayon producing firms—Tubize Rayon Corp., North American Rayon Corp., American Bemberg Corp., and American Enka.

### NFT-ACMI Merger

The board of directors of The National Federation of Textiles, Inc., has been authorized to take whatever action necessary to expedite a consolidation of the Federation with The American Cotton Manufacturers Institute, Inc. Members of the Institute previously approved such consolidation.

### Denman Sales Agents

The Denman Textile Rubber Co., of Cuyahoga Falls, Ohio, maker of pickers and other loom parts, has appointed two additional sales agents. They are Albert R. Breen, 80 East Jackson Blvd., Chicago 4, Ill. and R. D. Hughes, 2201 Cedar Springs, Dallas, Texas.

### New Interchemical Office

The New England headquarters of Interchemical Corp., Textile Colors Division, are now located at 201 Armistice Blvd., Pawtucket, R. I. The new headquarters' building contains larger offices, fully-equipped laboratories and enlarged warehousing facilities for the company's pigment colors and dyes for printing and dyeing textiles.

### Set Up Students' Awards

The New England Knitted Outerwear Manufacturers' Association has set up the Samuel P. Kaplan Memorial Fund which will permit two prizes of \$100 each to be awarded annually to the outstanding students in the basic knitting course at Lowell Technological Institute.

### Personnel Changes

**James W. Ritz** has become assistant sales manager of Emery Industries, Inc.'s Organic Chemical Sales Department, succeeding **R. T. Hull**. Mr. Hull has been named vice president and general manager of Emery's newly acquired Canadian subsidiary, Emery Industries (Canada) Ltd. Succeeding Mr. Ritz in his former capacity of eastern district sales manager of the Organic Chemical Sales Department, is **Joseph P. Clancy**.

Other changes in this department include the appointments of **Joseph E. Quinty**, sales representative at the Chicago office; **William C. Sowers**, sales representative at the N. Y. office; **Arthur R. McDermott**, New England representative. In Emery's Fatty Acid Sales Department **W. N. Fieglein** has been appointed to cover the southwest sales territory for Emery.

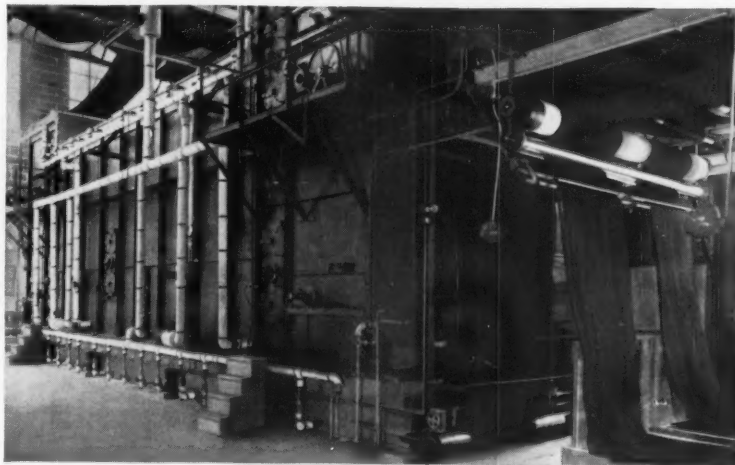
**Frank Supeno** has been appointed general sales representative at Stein Hall & Co., Inc.'s Charlotte, N. C. branch.

**Jacques A. Arrouet** has joined the Man-Made Fiber Producers Association as assistant to **Giles E. Hopkins**, research director.

Here is an immediate opportunity  
for **PROFIT**

*the Proctor & Schwartz Loop Ager for printed fabrics*

- PAYS FOR ITSELF IN ONE YEAR
- REPLACES 5 ROLLER AGERS
- REQUIRES ONLY 2 MEN PER SHIFT
- VIRTUALLY ELIMINATES AGEING "SECONDS"



The Proctor & Schwartz Loop Ager has been proven to pay for itself quickly—often yielding profits equal to original investment in a single year. Completely outmoding existing units, this advanced system for ageing vat dyed print goods does the work of five roller agers, cuts floor space needed in half, and eliminates ageing re-runs. One installation saved \$45,000 per year in direct labor alone, with savings in dyestuffs, glycerine and steam exceeding this amount. Standard sizes range from 2 to 7 units—supplying outputs from 27,000 to 95,000 yards per shift. Proctor engineers will be glad to make recommendations for the exact equipment to meet your particular production requirements. Write for information.

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**PROCTOR & SCHWARTZ, Inc.**  
PHILADELPHIA 20, PA.

Manufacturers of Textile Machinery and Industrial Drying Equipment

# U. S. MAN-MADE FIBER PRICES

This schedule lists the prices of yarns, staple and tow as reported by the producers in June, 1957. All prices are given as subject to change without notice.

## RAYON FILAMENT YARN

### American Bemberg

Current Prices

#### Regular Production Reel Spun Yarn

Den./Fil.	No Twist Skeins	Twisted* Skeins & Cones	3 1/2 Turns	High Twist Skeins & Cones	12 Turns	15 Turns	18 Turns
40/30	\$1.49	\$1.95	.....	.....	.....	.....	\$2.08
50/36	1.24	1.50	.....	.....	.....	.....	1.72
65/45	1.14	1.30	.....	.....	.....	.....	1.58
75/60**	1.04	1.18	.....	.....	.....	.....	1.46
100/74**	.95	1.08	.....	.....	.....	.....	1.38
125/90	.94	1.05	\$1.09	.....	.....	.....	1.44
150/120	.93	1.02	1.12	1.27	.....	.....	.....
300/225	.....	.95	.....	.....	.....	.....	1.08

\* Twist includes twists up to 6 turns on 40 and 50 denier, and up to 5 turns on heavier deniers.

\*\* Spun Dyed Cupracolor Black 15¢ per lb. extra.

#### "44" HH Spool Spun Yarn

Den./Fil.	No Twist Tubes	No Twist Beams	3 1/2 Turns	5 Turns	12 Turns	15 Turns	18 Turns
40/30	\$1.35	\$1.35	.....	.....	.....	.....	.....
50/36	1.05	1.00	.....	.....	.....	.....	.....
65/45	.....	.....	.....	.....	.....	.....	.....
75/45*	.97	.....	\$1.08	\$1.08	\$1.31	1.31	\$1.39
100/60*	.89	.....	1.03	1.03	1.23	1.23	1.31
125/90	.84	.....	.99	.99	.....	.....	.....
150/90*	.77	.....	.81	.81	1.15	1.15	1.24
150/120	.81	.....	.....	.93	.....	.....	.....

\* Available also in Spun Dyed Cupracolor Black at 15¢ per lb. extra.

#### Nub-Lite (Short Nubbi)

Code	Den./Fil.	3 1/2 Twist Skeins	5 Twist Cones*	5 Twist Skeins	5 Twist Cones*
1515	150/90	.....	.....	\$1.45	\$1.35
1519**	150/90	.....	.....	1.45	1.35
2008	200/120	.....	.....	1.06	.96
2027***	200/120	.....	.....	1.06	.96
3002	300/180	\$1.10	\$1.00	.....	.....
4011	400/224	1.10	1.00	.....	.....
6001	600/360	1.08	.98	.....	.....
8001	800/450	1.08	.98	.....	.....

\* Basic price for cones when dyed. Dyed Colors 30 and 35 cents above basic price. Prices based on 200 lb. dyed lots only. Prices for natural yarn on cones same as skein prices.

\*\* Code 1515 can be run in warp or filling.

\*\*\* Code 2027—Softer than 2000.

#### CUPIONI Type B

Code	Den./Fil.	No Twist Skeins	3 1/2 Twist Cones	5 Twist Cones
9610	50/30	\$1.39	.....	\$2.14
9650	70/45	1.29	\$1.64	.....
9660	100/60	.....	1.48	.....
1545	150/90	.....	1.25	.....
9720	200/120	.....	1.20	.....
9730	275/135	.....	1.10	.....
9792	450/225	.....	1.10	.....
9814	600/372	.....	1.07	.....
9847	900/372	.....	.97	.....

"Spun Dyed Cupracolor is spun 150, 275, and 900 deniers at 35¢ per pound extra. Cupracolor Black comes in all deniers."

#### Long Type A

Code	Den./Fil.	3 1/2 Twist Cones	5 Twist Cones
9690	150/135	\$1.20	\$1.25
9739	275/135	1.05	1.10
9781	450/372	1.05	1.10
9816	600/372	1.02	1.07
9827	900/372	.95	1.00
9877	1250/372	.95	1.00
9826	2500/744	.95	1.00

#### STRATA SLUB

Code	Den./Fil.	Twist	Price
9697	150/135	3 1/2	1.30
9747	275/225	3 1/2	1.20
9798	450/372	2 1/2	1.10
9823	600/372	2 1/2	1.05
9847	950/372	2 1/2	.97
9885	1250/372	1 1/2	.95
9934	2500/744	1 1/2	.95
9964	5000/1488	1 1/2	.95

"Spun Dyed Cupracolor is spun in 600 and 950 deniers at 35¢ per pound extra."

#### FLAIKONA

Code	Den./Fil.	Twist	Price
9769	300/224	3 1/2	1.40
9807	600/405	2 1/2	1.20
9840	950/450	2 1/2	1.10

"Spun Dyed Cupracolor Black 35¢ per pound extra."  
Terms: Net 30 days, F. O. B. shipping point. Minimum freight allowed to consignee's nearest freight station east of the Mississippi River. To points west of the Mississippi River minimum freight allowed to Memphis, Tennessee. Goods after shipment shall be at buyer's risk. Merchandise transported in seller's own trucks or those of its affiliates is sold F. O. B. delivery point.

### American Enka Corp.

Current Prices

Effective December 4, 1956

Standard Quality Yarns

#### Standard Quality Rayon Yarns

##### A. Natural

Den./Fil.	Luster	Turns	Weaving Cones	Beams	Long	Short	Cakes	Knitting Cones
50/18	E	5 S	.....	.....	.....	.....	.....	1.56
75/10	B	3 S&Z	.....	.....	.....	.....	1.08	1.22
75/18	B	4 S	.....	.....	.....	.....	1.08	1.17
75/30	B	2.5 S&Z	1.17	1.17	.....	.....	1.08	1.22
75/30	B	8 S	1.22	.....	.....	1.37	.....	.....
75/45	P,E	2.5 S&Z	1.17	1.17	1.23	1.37	1.08	1.17
75/60	B,P	3.4 Z	1.22	.....	.....	.....	1.10	1.22
100/14	B,P	3 S&Z	.....	.....	.....	1.12	.96	.....
100/40	B,E	12 S	.....	.....	.....	.....	1.27	.....
100/40	B,P,E	4.5 S&Z	.....	.....	.....	.....	.96	1.04
100/40	B	6 S	.....	.....	.....	.....	.....	.....
100/40,60	B,P	2.5 S&Z	1.04	1.04	1.08	1.12	.96	1.04
100/60	E	2.5 S	1.08	1.08	.....	.....	.98	.....
125/40	E	3 Z	.....	.....	.....	.....	.....	.96
150/40	B,P,E	2.1 S&Z	.91	.91	.94	.99	.86	.90
150/40	B,E	5 S&Z	.91	.....	.94	.99	.86	.....
150/40	B,E	8 S&Z	.97	.....	1.00	1.05	.....	.....
150/40	B,P	10 S&Z	1.03	1.03	.....	.....	.87	.....
150/90	B,E	2.1 S&Z	.92	.92	.....	.....	.....	.82
200/40	P	3 Z	.....	.....	.....	.....	.....	.....
200/40	B,P	8 S	.....	.....	.....	.95	.....	.....
250/60	P,E	2.4 Z	.....	.....	.....	.....	.75	.....
300/50	B,E	3 S	.73	.73	.....	.....	.....	.....
300/60,120	B,P,E	2.1 S&Z	.73	.73	.....	.76	.71	.73
300/60	B	3.5 S	.73	.73	.....	.76	.71	.....
300/60	B	4.3 S	.76	.76	.....	.....	.74	.....
300/80	B	7 S	.83	.....	.....	.....	.....	.....
300/80,120 H.T.	B	2.5 S	.....	.....	.....	.....	.....	.....
450/80	B	3.4 S	.75	.75	.....	.72	.68	.....
600/80,120	B,E	3 S	.69	.69	.....	.....	.67	.....
900/120	B	3.4 S	.68	.....	.....	.....	.66	.....
900/120 H.T.	B	3.6 S	.70	.....	.....	.....	.68	.....

#### "Jet spun" Colored Yarns

Den./Fil.	Tenacity	Turns	Weaving Cones	Beams*	Cakes	Colors
100/40	Regular	2.5S	1.39	1.39	.....	All
150/40	Regular	2.1S	1.28	1.28	.....	All
200/40	Regular	8.5S	1.27	.....	.....	All
450/80	Regular	3.0S	1.05	.....	.....	All
300/40	High	3.4S	1.10	1.10	.....	All
600/80	High	3.4S	1.06	.....	.....	All
900/120	High	3.4S	1.05	1.05	.....	All

Registered trade mark of American Enka solution dyed rayon yarn.

\* Single color.

### American Viscose Corp.

Effective December 14, 1956

#### Graded Yarns

Denier	Filament	Type	Short Skeins	Long Skeins	All Cones Beams	Cakes
50	20	Bright & Dull	\$ ....	\$1.59	\$1.56	\$1.45
60	10	Bright	.....	.....	1.41	1.30
75	10-30	Bright	1.24	1.20	1.17	1.08
75	30	Dull	.....	.....	1.17	1.08
100	14-40	Bright	1.12	1.07	1.04	.96
100	60	Dull	.....	.....	1.06	.98
150	24-40-60	Bright & Semi-Dull	.99	.94	.91	.86
150	40	Dull	.....	.....	.91	.86
150	90	Dull	.....	.....	.92	.87
200	10-44	Bright	.90	.85	.82	.78
250	60	Semi-Dull & Dull	.82	.78	.75	.73
300	44	Bright & Dull	.79	.76	.....	.....
300	234	Dull	.....	.....	.75	.73
450	100	Bright	.....	.72	.70	.68
600	100	Bright	.....	.71	.69	.67
900	60-100-150	Bright	.....	.70	.68	.66
1200	75	Bright	.....	.67	.65	.....
2700	150	Bright	.....	.70	.68	.....

#### Extra Turns Per Inch

	Bright 6-Turns	\$1.36	\$1.32	\$1.29	\$ ....
75 30	Bright 6-Turns	1.24	1.19	1.16	1.08
100 40	Bright 6-Turns	1.09	1.04	1.01	.96
150 40	Bright 5-Turns	.....	.....	.....	.....
300 15	Bright 5-Turns	.....	.....	.86	.83
600 30	Bright 5-Turns	.....	.76	.74	.72

#### Rayflex Yarns

	Rayflex	\$ ....	\$ ....	\$ .94	\$ .89
150 60	Rayflex	.....	.....	.85	.81
200 75	Rayflex	.....	.....	.75	.73
300 120	Rayflex	.....	.....	.72	.70
450 120	Rayflex	.....	.....	.71	.69
600 234	Rayflex	.....	.....	.70	.68
900 350	Rayflex	.....	.72	.70	.....



Earle S. Pedigo has been appointed to the position of supervisor at American Viscose Corp.'s Marcus Hook plant, viscose section, film division.

Other appointments at the Marcus Hook plant, Research and Development Division include: **Dr. John A. Howsmon**, manager of basic research; **Joseph E. Ross**, manager of development; **Dr. Everett W. Lothrop, Jr.**, manager of technical services; **Dr. A. Ross Adams**, manager of the administrative office; **Richard H. Braunschlich**, leader of the viscose filament section which also includes the former tire yarn section; **Dr. Wayne A. Sisson**, technical assistant to the

vice president. Dr. Sisson will retain his duties as leader of the cellulose section.

**Michael J. Koroskys** has been named market research analyst for Chemstrand Corp. In the same company **Carl O. Hoyer** has become vice president of engineering and **Jack W. Mueller**, controller. **Guy C. Quick, Jr.** has been named field superintendent for the construction of Chemstrand Ltd.'s new Acrilan acrylic fiber plant, now being constructed in Northern Ireland.

**Herman L. Weisler** has been elected vice president in charge of all plant operations for Native Laces & Textiles, Inc.

## NON-FLUID OIL

TRADE MARK REGISTERED

### FOR GREATER PRODUCTION OF TOP-GRADE YARN

Seven out of ten mills today use NON-FLUID OIL for the lubrication of top rolls, bottom roll stands and saddles of long draft frames. They get greater production of cleaner, more even yarn at lower lubricant cost with this drip-less, spatter-less, full-time lubricant.

There are other savings too. NON-FLUID OIL lubricates until entirely used up. Thus it lasts longer and need not be applied as frequently as other lubricants . . . giving economies on both lubricant and application costs.

Write for Bulletin T-13 and your free sample of this proven spinning frame lubricant.

#### NEW YORK & NEW JERSEY LUBRICANT COMPANY

292 MADISON AVE., NEW YORK 17, N. Y.

WORKS: NEWARK, N. J.

Sa. Dist. Mgr.: Lewis W. Thomason, Jr. Charlotte, N. C.



WAREHOUSES		
Birmingham, Ala.	Greenville, S. C.	Greensboro, N. C.
Atlanta, Ga.	Chicago, Ill.	Detroit, Mich.
Columbus, Ga.	Springfield, Mass.	Providence, R. I.
Charlotte, N. C.		St. Louis, Mo.

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture. So-called grease imitations of NON-FLUID OIL often prove dangerous and costly to use.

## NYLON DACRON RAYON WORSTED



**COMPLETE PACKAGE SERVICE** on dyed and thrown filament yarns, delivered on tubes, cones or in the cake.

**Spun and Worsted Yarns**



*Dyers & throwsters of modern yarns since 1922*

## HOFFNER RAYON CO.

#### GENERAL OFFICES

General Offices at Belgrade & Ontario Streets, Philadelphia 34, Pennsylvania. Plants at Philadelphia and Quakertown, Pennsylvania.

#### SALES REPRESENTATIVES

The Tillinghast-Stiles Co., Providence, R. I., 327 South LaSalle St. Chicago, Ill., Shannonhouse & Wetzel, Johnston Building, Charlotte 2, N. C.

## Thick and Thin Yarns

150	40-90	Bright & Dull	\$	....	\$	....	\$1.15	\$	....
200	75	Bright & Dull	....	....	....	....	1.05	....	....
300	120	Bright & Dull	....	....	....	....	.95	....	....
450	100	Bright & Dull	....	....	....	....	.92	....	....
490	120	Bright & Dull	....	....	....	....	.95	....	....
900	350	Dull	....	....	....	....	1.00	....	....
920	120	Bright & Dull	....	....	....	....	1.00	....	....

## Colorspun Yarns

Currently producing regular and high tenacity at premiums at \$.35 per pound.

## Viscose Filament Yarns

The following material deposit charges are required:

Metal Section Beams	.....	\$170.00 each
Wooden Section Beams	.....	55.00 each
Wooden Section Beam Crates	.....	30.00 each
Metal Section Beam Racks	.....	75.00 each
Metal Tricot Spools—14" flange	.....	30.00 each
21" flange	.....	60.00 each
32" flange	.....	150.00 each
Metal Tricot Spool Racks—14" flange	.....	135.00 each
21" flange	.....	100.00 each
32" flange	.....	75.00 each
Wooden Tricot Spool Crates	.....	20.00 each
Cloth Cake Covers	.....	.05 each

Same to be credited upon return in good condition—freight collect. Terms: Net 30 days.

## Celanese Corp. of America

### Current Prices

Effective December 14, 1956

Den. Fil. Twist	Beams	Cones	Cakes	Non Shrunken Tubes
<b>#40 and #14 Production</b>				
75/30/3 Bright		\$1.11	\$1.03	....
100/40/2Z	\$.96			....
100/40/3 "	.96	.96	.91	....
100/40/5 "		1.02	.97	....
100/60/3 "		.97	.92	....
125/40/2Z "	.94	.92		....
150/40/3 "	.89	.85	.80	....
150/40/2Z "	.87			....
150/40/5 "		.91	.86	....
150/40/8 "		.97	.92	....
150/40/0 " NS		.71		....
300/50/3 "	.72	.71	.69	....
300/50/0 " NS		.63		....
<b>#20 Production</b>				
150/40/3 Bright	.87	.83	.78	....
150/40/0 " NS		.71		....
150/40/2Z "	.87			....
300/50/3 "	.72	.71	.69	....
300/50/0 " NS		.63		....
<b>#20 Production</b>				
100/40/3 Dull		.96	.91	....
100/60/2Z "	1.00			....
100/60/0 "		.93		....
100/60/5 "	1.04	1.02	.97	....
150/40/3 "	.87	.83	.78	\$.77
150/40/0 " NS		.71		....
150/90/3 "		.90	.85	....
250/60/0 " NS		.67		....
250/60/3 "		.75		.70
<b>#52 Thick &amp; Thin Rayon</b>				
150/60/3 Bright		1.15		....
450/120/3 "		.89		....

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U.S.A. east of the Mississippi River.

Prices subject to change without notice.

All previous prices withdrawn.

Note: Prices on unlisted items can be obtained upon request.

## E. I. du Pont de Nemours & Co.

### Textile Fibers Dept.

### Current Prices

Effective with orders December 7, 1956

## Bright and Dull

Den.	Fil.	Turns/Inch Up to	(A) Cones, Beams, Tubes	Skeins	Cakes
40	20	3	Textile "Cordura"	\$1.90	\$1.85
50	20	3		1.63	
50	20	3	Textile "Cordura"	1.65	1.60
50	35	3	Textile "Cordura"	1.70	1.65
75	10	3		1.17	1.08
75	15	3		1.17	1.08
75	30	3		1.17	1.08
100	15	3		1.04	.96
100	40	3		1.04	.96
100	60	3	Bright	1.04	.96
100	60	3	Dull	1.06	.98
125	50	3		.96	.90
150	40	3		.91	.86
150	60	3		.91	
150	60	3	Textile "Cordura"	.92	.87
150	90	3	Dull	.92	.87
150	100	3	Dull	.92	.87
200	35	3		.82	.78
200	20	3		.82	
300	50	3.5		.73	.71
300	120	3	Textile "Cordura"	.74	.72
450	72	3		.70	.68
600	96	3		.69	.67
600	240	3	Textile "Cordura"	.70	.68
900	50	3		.68	.66
900	144	3		.68	.66
1165	480	3	Textile "Cordura"	.68	.65
1800	100	3		.68	
2700	150	3		.68	.70
5400	300	3		.75	

## Thick and Thin

100	40	3	#7	1.38		1.38
150	90	3	#7	1.15	1.16	1.15
200	80	3	#7	1.05	1.06	1.05
450	100	3	#7	.89	.90	.89
1100	240	3	#50	1.32		1.32
2200	480	3	#50	1.14		1.14

## Fiber E

300	50	2.5		.88		
900	50	2.5		.83		
900	90	2.5		.83		
2700	150	2.5		.88		
2700	270	2.5		.88		
5400	540	2.5		.88		

(A) 2¢/lb. additional for cones less than 3# and tubes less than 2#.

Terms: Net 30 days.

Domestic Freight Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

\* "CORDURA" and "SUPER CORDURA" are DuPont's registered trade-marks for its high tenacity rayon yarn.

## Industrial Rayon Corp.

Effective December 21, 1956

Denier	Filament	Turns per In.	Type	2.8 Lb Cones	4.4 Lb Cones	Beams	2.2 Lb Tubes	4.4 Lb Tubes
100	40	2.5 "S"	Bright	1.04		1.04		
150	40	2.5 "S"	Bright	.91		.91		
150	40	2.5 "S"	Luster #4	.91		.91		
150	40	2.5 "S"	Bright inter-mediate strength	.92				
200	20	2.5 "S"	Bright	.82				
200	40	2.5 "S"	Bright	.82				
300	44	2.5 "S"	Bright	.73		.73		
300	80	2.5 "S"	Bright	.73		.73		
300	80	2.5 "S"	Luster #4	.73		.73		
300	80	2.5 "S"	Bright extra strong	.75		.75		
450	60	2.0 "S"	Bright		.70	.70		
600	90	1.5 "S"	Bright		.69	.69	.69	.69
900	50	2.0 "S"	Bright		.68	.68	.68	.68
900	150	1.5 "S"	Bright		.68	.68	.68	.68

Luster #4 is semi-dull.

Terms: Net 30 days f.o.b. point of shipment; title to pass to buyer on delivery of goods to carrier. Domestic transportation charges prepaid with transportation allowed at lowest published rate to all points east of the Mississippi River. PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

## North American Rayon Corp.

### Current Prices

First Quality Yarns	Den./Fil	Twist	Knitting Cones	No Twist Knitting Cones	Beams, Tubes, and Weaving Cones	Unbleached Cakes
	75/30	3.5			\$1.17	\$1.08
	75/30	7			1.30	
	75/30	15			1.37	
	75/30	20			1.40	
Normal Strength Yarns	100/40/60 Brl.	3.5			1.04	.96
NARCO	100/40/60	12			1.22	
	125/52/60	3			.96	.90
	125/52	10			1.13	
	150/42/60/75	3	\$ .90		.91	.86
	150/42	0		\$ .71		
	300/75	3	.73		.73	
	300/75	0		.63		
	600/98	3		.69	.69	
	900/46	2.5		.68	.68	
	1800/92	2.5		.68	.68	
Semi-High Strength Yarns	300/75	3			.74	

\* Oiled Cones \$.01 Per Pound extra for Graded Yarns only.

\*\* 1 lb. tubes \$.02 Per Pound extra for Graded Yarns only.

Terms: Net 30 days, F.O.B. shipping point, minimum freight allowed to consignee's nearest freight station east of the Mississippi River. To points west of the Mississippi River minimum freight to Memphis, Tennessee allowed. Goods after shipment shall be at buyer's risk. Merchandise transported in seller's own trucks or those of its affiliates is sold F.O.B. delivery point. Prices subject to change without notice.

## RAYON HIGH TENACITY YARN and FABRIC

### American Enka Corp.

Effective November 1, 1956

## Tempra (High Tenacity)

Denier	Elongation	Beams & Cones
1100/480	Low	.59
1230/480	High	.59
1650/720	Low	.55
1820/720	High	.55
2200/960	High & Low	.55
	Suprenka (Extra High Tenacity)	
1650/720	Low	.58
1900/720	High	.58
2200/960	Low	.57

\* Beams Only.

Terms: Net 30 days, f.o.b. Enka, North Carolina, or Lowland Tennessee; minimum freight allowed to first destination east of the Mississippi River.

**Edward B. Moebus** and **Samuel B. Roberts** have been named vice presidents for Lockwood Greene Engineers, Inc.

**Herbert E. Kegelman** has been elected president of Linen Thread Co., Inc., succeeding **H. Wickliffe Rose**. Mr. Rose will continue as a director and consultant.



F. C. Butler

**Fred C. Butler** has become director of manufacturing at Pneumafil Corp.

**William A. Juenger** has joined Stein, Hall & Co., Inc.'s St. Louis Branch office as a sales representative.

**T. R. Leebrick** and **James L. Painter** have joined Uster Corp.'s Testing Equipment Department as service engineers for the mid-eastern and northern areas.



E. D. Carman

**Edward D. Carman** has joined the instrument sales staff of Universal Winding Co. to cover the S. C. and Ga. territories.

**D. G. Zachary** has been named district sales manager for textile resins in the metropolitan New York-New Jersey area for American Cynamid Co.'s Organic Chemicals Division. He succeeds **R. M. Fischer** who has retired.

**Laurence T. Gerrity** has been appointed assistant general sales manager of Celanese Corp. of America's textile division and **R. P. Wilson** has become sales development manager of the same division.

**Ivan Bollinger** has joined Chemstrand Corp. as export manager, and **Edward L. Pratt** has joined the corporation in a sales capacity.

**Melva A. Chesrown** has re-joined Dow Chemical Co. and will serve as a consumer information consultant.

**Harry V. Reiner** has been elected president of R. G. Buser Silk Corp., succeeding **Raymond G. Buser**, deceased. **Eleanor Buser Reiner**, has become executive vice president, **Bart E. Buser**, vice president and secretary, and **Harold G. MacKenzie**, treasurer.

**Garland L. Atkins** has been appointed tabulating supervisor at the film division of American Viscose Corp.'s Marcus Hook plant.

**David H. Abrahams**, chemist has joined Dexter Chemical Corp. at its New York laboratories.



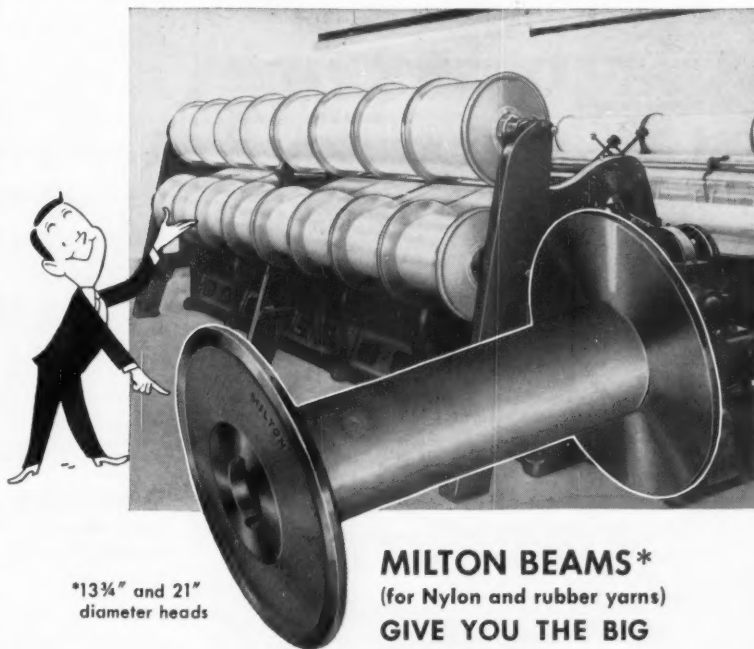
T. Scott Avery



H. D. Ruhm, Jr.

**Herman D. Ruhm, Jr.** has resigned as president of Burlington Industries to become president of Wellington Sears Co. He succeeds **T. Scott Avery** who has become vice chairman of the board of Wellington.

(Continued on Page 83)



\*13 $\frac{3}{4}$ " and 21" diameter heads

**MILTON BEAMS\***  
(for Nylon and rubber yarns)  
**GIVE YOU THE BIG BONUS OF**

## SUPER STRENGTH

The super strength of Milton's forged head Tricot and Raschel Beams is no idle claim—it's been proven by yarn producers, big mills and small mills alike!

They're light in weight, yet rugged in design to give true dimensional stability without objectionable deflection or distortion. Milton's forged, heat-treated aluminum alloy heads and extra heavy barrels become a one-piece beam by the continuous weld process first introduced in the field by Milton. Trapped ends of yarn or misalignment of keyways are eliminated because there are no mechanical joints!

You name the yarn . . . monofilament, fine denier, low turn or high twist—synthetics or rubber, Milton gives you true-running, well balanced beams to handle unprecedented yardages and extreme pressures!

**WRITE FOR FREE BULLETINS . . .** No. 49-A on Light Metal Beams and No. 54-S on Steel Beams. The Milton line includes warp beams for broad, narrow fabric, velvet and carpet looms, as well as light metal raschel, tricot and section beams.



Over a Quarter Century of Dependability in Yarn Beams

**MILTON MACHINE WORKS, INC.**

DESIGNERS • ENGINEERS • MANUFACTURERS

**MILTON • PENNA.**

## American Viscose Corp.

Effective November 1, 1956

Revised November 14, 1956

Super Rayflex				
Denier	Filament	Twist	Beams	Cones
1100	490	0	\$.63	\$.63
1100	490	4.1Z	.63	
1650	980	0	.58	.58
1650	980	4.1Z	.58	
2200	980	0	.57	.57

Tire Yarn				
Denier	Filament	Twist	Beams	Cones
1100	490	2.5Z	.59	....
1650	980	0	.55	.55
1650	980	3.2Z-3.6Z	.55	
2200	980	0	.55	.55

High Strength				
Denier	Filament	Twist	Beams	Cones
1150	490	2.5Z	.59	.59
1230	490	3.6Z	.59	.59
1650	980	3.5Z	.55	.55
1875	980	3.6Z	.55	.55

Super Rayflex, Tire Yarn and High Strength yarns are sold "Not Guaranteed for Dyeing."

Tire Fabric				
Denier	Filament	Twist	Beams	Cones
1100/490/2		2.5Z	\$.69	\$.73
2200/980/2		0	.635	.655

Above prices based on 80% minimum Carcass, 15% maximum Top Ply, 5% maximum Breaker.

* Production Factor				
Denier	Open	Carcass	Top Ply	Breaker
525	490			
300	490			
115	275**			

\*\* Determined by dividing total ends by picks.  
\* Orders limited to 5% of total 1650 Fabric booked for any given period.

The following deposit charges are made on invoices:				
Beams			\$55.00 each	
Crates (Metal)			75.00 each	
Fabric Shell Rolls			3.50 each	

Same to be credited upon return in good condition—freight collect

Terms: Net 30 days.

## Celanese Corporation of America

Effective December 27, 1955

Supersedes September 12, 1955

Fortisan Yarn Prices				
Denier	Packages	Natural	Black	
30/2.5/40	2 lb. Cones	\$3.00 lb.	\$3.35 lb.	
60/2.5/80	4 " "	2.40 "	2.75 "	
90/2.5/120	4 " "	2.25 "	2.60 "	
120/2.5/160	4 " "	2.05 "	2.40 "	
150/2.5/180	4 " "	1.95 "	2.30 "	
270/2.5/380	4 " "	1.85 "	2.20 "	
300/2.5/380	4 " "	1.85 "	2.20 "	

60/2.5/80 Olive Green—Spun Dyed—OG106 4 lb. Cones 3.50 lb.  
Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U. S. A. east of the Mississippi River.

Prices subject to change without notice.  
All previous prices withdrawn.  
Note: Prices on unlisted items can be obtained upon request.

Fortisan-36 Rayon Yarn				
Bright				
Denier and Filament	Twist	4# cones	8# cones	Beams
270/280	0.8Z	\$2.30		
300/280	0.8Z	\$2.05		
400/400	0.8Z	\$1.75		
400/400	0			\$1.70
800/800	0.8Z	\$1.25	\$1.25	\$1.20
800/800	0			\$1.25
1600/1600	0.8Z	\$1.15	\$1.15	\$1.10
1600/1600	0			\$1.15

Terms: Net 30 days. Shipments prepaid to any destination in U. S. A. East of the Mississippi River. Shipments West of the Mississippi will be made on a collect freight basis and allowance will be made for the lowest transportation cost to the point of river crossing.

Prices subject to change without notice.  
All previous prices withdrawn.  
Note: Prices on unlisted items can be obtained upon request.

## E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

Effective with shipments December 7, 1956

"Super Cordura"*				
Denier	(all packages)	2	3	4
1100	480			\$.63
1250	480			.63
1650	720			.58
1900	720			.58
2200	960			.57
2450	960			.57

Terms: Net 30 days.  
Domestic Freight Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

\* "CORDURA" and "SUPER CORDURA" are DuPont's registered trade-marks for its high tenacity rayon yarn.

## Industrial Rayon Corp.

Effective November 1, 1956

### Unbleached Bright High Tenacity Yarns

SINGLE END BEAMS AND CONES:				
Den.	Fil.	Turns Per In.	4.4 Lb. Cones	2.2 Lb. Tubes
1100	480	1.5 "Z"	.59	.59
1650	720	1.5 "Z"	.55	.55
2200	1000	1.5 "Z"	.54	.54
3300	1440	1.5 "Z"	.54	.54
4400	2000	1.5 "Z"	.54	.54

"Above Prices apply to Type 100. Type 200 Tyron Prices are 3¢ more."

Terms: Net 30 days f.o.b. point of shipment; title to pass to buyer on delivery of goods to carrier. Domestic transportation charges allowed at lowest published rate to all points east of the Mississippi River.

Prices are subject to change without notice.

## North American Rayon Corp.

High-Strength Yarns—SUPER-NARCO				
Denier	Twist	Cones	Beams	
1650	720	3Z		\$.55
1850	720	3Z	\$.55	

Super High Strength Yarns—1.5Z .58 .58  
Terms: Net 30 days, f.o.b. shipping point. Minimum freight allowed to consignee's nearest freight station East of the Mississippi River. To points West of the Mississippi River minimum freight to Memphis, Tenn. allowed. Goods after shipment shall be at buyer's risk. Merchandise transported in seller's own trucks or those of its affiliates if sold f.o.b. delivery point.

## ACETATE FILAMENT YARN

### American Viscose Corp.

Current Prices

Effective December 21, 1956

Bright and Dull				
* Intermediate Twist				
Denier & Filaments	4-6 Lb. Tubes	Twister Tubes	Warps	Spinning Cones
55/14	\$1.04	\$1.02	\$1.05	\$.98
75/20	1.00	.98	1.01	.94
100/28	.95	.93	.96	.89
120/32	.86	.84	.87	.80
150/41	.77	.76	.78	.72
200/54	.73	.72	.74	.69
300/80	.69	.68	.70	.66

\* Standard Twist 2¢ additional.  
Terms: net 30 days.

## Celanese Corp. of America

Current Prices

Effective December 20, 1956

Bright and Dull				
Intermediate Twist				
Denier and Filaments	4 & 6-Lb. Cones	6-TM Tubes	4-Pound Cheeses	O Twist Tubes
45/13	\$1.17	\$1.18	\$1.12	\$.95
55/15	1.04	1.05	.98	.925
75/20	1.00	1.01	.94	.84
75/50	1.02	1.03	1.00	.89
100/28-40	.95	.96	.93	.81
120/40	.86	.87	.85	.81
150/40	.77	.78	.77	.73
200/52	.73	.74	.73	.70
300/80	.69	.70	.69	.63
450/120	.67	.68	.67	.64
600/160	.65	.66	.65	
900/80-240	.63	.64	.63	.61
150 Denier 12-TM Tubes		.76		
55/0/15 Dull Tricot Beams		.985		
2-Pound Cheeses		.01 Less Than 4-Pound Cheeses		
2-BU and 4-BU Tubes		Same Price as 4 and 6-Lb. Cones		
2-Lb. Twist Tubes		.01 Less Than 4 & 6-Lb. Twist Tubes on 120, 200 and 300 Denier Intermediate Twist		

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U.S.A. east of the Mississippi River.

Prices subject to change without notice.  
All previous prices withdrawn.  
Note: Prices on unlisted items can be obtained upon request.

## Celaperm Filament Yarn Prices

Intermediate Twist				
Denier and Filaments	4 & 6-Lb. Cones	Beams	Cones	Beams
55/15	\$1.37	\$1.38	\$1.31	\$1.32
75/20	1.34	1.35	1.28	1.29
100/26	1.28	1.29	1.22	1.23
120/40	1.19	1.20	1.13	1.14
150/40	1.11	1.12	1.06	1.07
200/52	1.05	1.06	1.01	1.02
300/80	1.01	1.02	.97	.98
450/120	.99	1.00	.95	.96
600/160	.97	.98		
900/80	.94			

3 to 5 Turns on Cones or Beams — \$.02 Additional

Effective March 11, 1955





**maximum  
performance...  
durability**  
*with*

**BAKER**

**precious metal  
spinnerettes**

From any viewpoint—hardness, grain characteristics, corrosion resistance, hole and surface finish—you'll find that Baker Precious Metal Spinnerettes meet and exceed your every requirement.

Precious Metal Spinnerettes by Baker reflect high quality workmanship, superior care and skilled supervision at every step in their manufacture—from melting, alloying, rolling to cup-forming.

The result is a spinnerette which offers maximum performance and protection against mechanically inflicted damage and chemical corrosion.

In addition to Precious Metal Spinnerettes, Baker can supply Stainless Steel Spinnerettes produced with similar high quality workmanship that offer rigidly controlled hardness and grain characteristics. They provide mirror-like finish throughout the hole, an extremely sharp hole edge and a surface finish that offers maximum protection against corrosion.

Write for your copy of "Spinnerettes For Synthetic Fibers".

**BAKER** **PRECIOUS  
METALS**

**BAKER & CO., INC.**, 113 ASTOR STREET, NEWARK 5, NEW JERSEY  
NEW YORK • SAN FRANCISCO • LOS ANGELES • CHICAGO

ENGELHARD INDUSTRIES



**KEEP COST  
. . . . DOWN!**



USE  
SUPERIOR  
PERFORMING . . . .

**HEANIUM<sup>®</sup>**  
**TEXTILE GUIDES**

Test Samples of  
**HEANIUM**  
stock guides  
will be furnished  
without  
charge

Address sample  
requests to Dept. 9.

**HEANY INDUSTRIAL  
CERAMIC CORP.**  
New Haven 3, Conn.

MOH's hardness 9.5	Water absorption	O.O. impervious
Specific Gravity 3.80	Safe operating temperature	°C 1500 °F 2800

**HEANY INDUSTRIAL CERAMIC CORP.**  
NEW HAVEN 3, CONNECTICUT

Southern Representative:  
RALPH GOSSETT & CO., GREENVILLE, SO. CAROLINA  
Representative Engineer:  
ROBERT CARROLL, 408 MC IVER ST., GREENVILLE, SO. CAROLINA  
New England Representative:  
AMERICAN SUPPLY CO., CENTRAL FALLS, R. I.

## Celaperm Black Yarn Prices

Denier and Filaments	Intermediate Twist 4 & 6-Lb.		Spinning Twist	
	Cones	Beams	Cones	Beams
55/15	\$1.17	\$1.18	\$1.11	\$1.12
75/20	1.14	1.15	1.08	1.09
100/28	1.08	1.09	1.02	1.03
120/40	.99	1.00	.93	.94
150/40	.91	.92	.86	.87
200/52	.85	.86	.81	.82
300/80	.81	.82	.77	.78
450/120	.79	.80	.75	.76
600/160	.77	.78	.....	.....
900/80	.74	.....	.....	.....

3 to 5 Turns on Cones or Beams — \$.02 Additional

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U.S.A. east of the Mississippi River.

Prices subject to change without notice.

All previous prices withdrawn.

Note: Prices on unlisted items can be obtained upon request.

## E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

Denier & Filament	Acetate				Intermediate Twist			
	Zero Twist		Low Twist		Intermediate Twist		Intermediate Twist	
	Tubes	Beams	Cones	Beams	2 & 4 Lb. % Tubes	4 & 6 Lb. Tw. Tubes	Cones	Beams
45-13	\$1.03	\$1.11	\$1.11	\$1.12	.....	.....	\$1.17	\$1.18
45-24	1.03	1.11	1.11	1.12	.....	.....	1.17	1.18
55-18	.925	.985	.....	.99	.....	.....	1.04	1.05
55-24	.925	.985	.....	.99	.....	.....	1.04	1.05
75-8	.94	.....	.....	.....	.....	.....	.....	.....
75-24	.94	.94	.94	.95	.....	.....	1.00	1.01
75-50	.89	.....	.....	.97	.....	.....	1.02	1.03
100-11	.90	.....	.98	.....	.....	.....	1.04	.....
100-24	.81	.....	.89	.90	.....	.....	.93	.95
100-32	.81	.....	.89	.90	.....	.....	.93	.95
100-66	.83	.....	.....	.....	.....	.....	.95	.97
120-40	.77	.80	.80	.81	.....	.....	.85	.86
120-80	.77	.80	.80	.81	.....	.....	.85	.86
150-16	.72	.....	.....	.....	.....	.....	.81	.81
150-40	.69	.72	.72	.73	.....	.....	.77	.77
200-60	.68	.....	.69	.70	.....	.....	.73	.74
240-80	.....	.....	.67	.....	.....	.....	.71	.....
300-40	.63	.....	.....	.....	.....	.....	.69	.70
300-80	.63	.65	.65	.66	.....	.....	.69	.70
450-120	.63	.....	.63	.64	.....	.....	.67	.68
600-80	.....	.....	.....	.....	.....	.....	.65	.....
600-160	.....	.....	.62	.63	.....	.....	.65	.66
900-44	.61	.....	.62	.63	.....	.....	.63	.64
900-70	.61	.....	.62	.63	.....	.....	.63	.64
900-240	.....	.....	.62	.63	.....	.....	.63	.64
1800-88	.....	.....	.60	.61	.....	.....	.61	.62
1800-140	.....	.....	.60	.61	.....	.....	.61	.62
2700-132	.....	.....	.60	.61	.....	.....	.61	.62
2700-210	.....	.....	.60	.61	.....	.....	.61	.62
3000-210	.....	.....	.....	.61	.....	.....	.61	.62

(A) Regular Twist (2.9 thru 5 T.P.I.)—add \$.02 to Intermediate Twist Price.

(B) 1 lb. % Tubes—add \$.02 to 2 & 4 lb. % Tube Price.

(C) 2 lb. Twisted Tubes are the same as 4 & 6 lb. tubes except on 150, 200 and 300 denier Intermediate Twist where the price is \$.01 less.

## Color-Sealed

Denier & Filament	Zero Twist		Low Twist		Intermediate Twist			
	Tubes	Beams	Cones	Beams	Twisted Tubes			
55-18	\$1.245	\$1.315	.....	.....	2 Lb. 4 & 6 Lb. Cones	Beams	.....	.....
75-24	1.18	1.28	.....	.....	1.35	1.35	1.37	1.38
100-32	1.14	1.22	1.23	1.26	1.32	1.32	1.34	1.35
150-40	1.03	1.06	1.06	1.07	1.10	1.11	1.11	1.12
200-60	1.00	1.01	1.02	1.04	1.05	1.05	1.05	1.06
300-80	.95	.97	.97	.98	1.00	1.01	1.01	1.02

(A) Regular Twist—Add \$.02 to Intermediate Twist Price.

## Black

Denier & Filament	Zero Twist		Low Twist		Intermediate Twist			
	Tubes	Beams	Cones	Beams	2 & 4 Lb. % Tubes	4 & 6 Lb. Tw. Tubes	Cones	Beams
55-18	\$1.045	\$1.115	.....	.....	.....	.....	\$1.12	\$1.13
75-24	.98	1.08	1.08	1.09	.....	.....	1.12	1.13
100-32	.94	.....	1.02	1.03	.....	.....	1.08	1.09
150-40	.83	.86	.86	.87	.....	.....	.91	.92
200-60	.80	.....	.81	.82	.....	.....	.85	.86
300-40	.75	.77	.77	.78	.....	.....	.81	.82
300-80	.....	.....	.77	.78	.....	.....	.81	.82
450-120	.75	.77	.77	.78	.....	.....	.79	.80
600-160	.....	.....	.75	.76	.....	.....	.77	.78
900-44	.72	.....	.73	.74	.....	.....	.74	.75
900-70	.72	.....	.73	.74	.....	.....	.74	.75
900-240	.....	.....	.73	.74	.....	.....	.74	.75

(A) Regular Twist (2.9 thru 5 T.P.I.)—add \$.02 to Int. Twist Price.

(B) 1 lb. % Tubes—add \$.02 to 2 & 4 lb. % Tube Price.

(C) 2 lb. Twisted Tubes are the same as 4 & 6 lb. Twisted Tubes except on 150, 200 and 300 denier Intermediate Twists where the price is \$.01 less.

## Specialty Yarns

Same Price as Regular Yarn

Same Price as Regular Yarn

Type 20	.....	.....
Type C	.....	.....
Type C—Thick & Thin	.....	.....
100-22	Int. Twist 4 lb. Cones	\$1.39

Denier & Filament	Natural		Black		Color-Sealed	
	Cones	Beams	Cones	Beams	Cones	Beams
200-64 Int. Twist	1.05	.....	\$1.15	.....	.....	.....
200-64 Reg. Twist	1.08	\$1.09	1.17	\$1.21	.....	.....
300-80 Int. Twist	1.00	.....	.....	.....	.....	.....

Terms: Net 30 days. Subject to change without notice.

Domestic Freight Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

## Eastman Chemical Products, Inc.

Tennessee Eastman Co.

Effective December 21, 1956

## "Estron" Yarn, Bright or Dull — White

Denier & Filament	Regular Twist		Intermediate Twist		Low Twist		Zero Twist		Tritcot Beams	
	Cones	Beams	Cones	Beams	Cones	Beams	Cones	Beams	Cones	Beams
55/13	\$1.06	\$1.04	\$1.02	\$1.05	.98	.99	.92%	.92%	.99	.98%
75/19	1.02	1.00	.98	1.01	.94	.95	.84	.85	.95	.....
75/49	1.04	1.02	.....	1.03	.....	.....	.....	.....	.....	.....
100/25	.97	.95	.93	.96	.89	.90	.81	.....	.....	.....
120/30	.88	.86	.84	.87	.80	.81	.....	.....	.....	.....
150/38	.79	.77	.....	.78	.72	.73	.69	.....	.....	.....
200/50	.75	.73	.....	.74	.69	.70	.....	.....	.....	.....
300/75	.71	.69	.....	.70	.65	.66	.63	.....	.....	.....
450/114	.69	.67	.....	.68	.63	.64	.....	.....	.....	.....
600/156	.67	.65	.....	.66	.62	.63	.63	.....	.....	.....
900/230	.65	.63	.....	.64	.....	.....	.61	.....	.....	.....
Heavier	.....	.....	.....	.....	.....	.....	.56	.....	.....	.....

Current Prices—December 19, 1955

## "Chromspun" — Standard Colors (Except Black)

Denier & Filament	Regular Twist		Intermediate Twist		Low Twist	
	Cones	Beams	Cones	Beams	Cones	Beams
55/13	\$1.39	\$1.40	\$1.37	\$1.38	\$1.31	\$1.32
75/19	1.36	1.37	1.34	1.35	1.28	1.29
100/25	1.30	1.31	1.28	1.29	1.22	1.23
150/38	.....	.....	1.11	1.12	1.06	1.07
300/75	.....	.....	1.01	1.02	.97	.98
450/114	.....	.....	.99	1.00	.95	.96
900/230	.....	.....	.94	.95	.....	.....

Current Prices

## "Chromspun" — Black

Denier & Filament	Regular Twist		Intermediate Twist		Low Twist & Spun Twist	
	Cones	Beams	Cones	Beams	Cones	Beams
55/13	\$1.19	\$1.17	\$1.18	\$1.18	\$1.12	\$1.12
75/19	1.16	1.16	1.14	1.15	1.09	1.09
100/25	1.10	1.08	1.08	1.09	1.03	1.03
150/38	.93	.91	.91	.92	.87	.87
200/50	.87	.85	.85	.86	.82	.82
300/75	.83	.81	.81	.82	.78	.78
450/114	.81	.79	.79	.80	.76	.76
900/230	.76	.74	.74	.75	.....	.....

Prices are subject to change without notice.

Prices on special items quoted on request.

Terms: Net 30 days. Payment—U. S. A. dollars.

Transportation charges prepaid or allowed to destination in the United States east of Mississippi River. Seller reserves right to select route and method of shipment. If Buyer requests and Seller agrees to a route or method involving higher than lowest rate Buyer shall pay the excess of transportation cost and tax.

\* "Estron" and "Chromspun" are trade-marks of the Eastman Kodak Co.

## RAYON STAPLE and TOW

American Viscose Corp.

Current Prices

Rayon Staple		Bright and Dull
Regular	.....	\$ .29
Extra Strength	.....	.....
1.0 Denier	.....	.34
"Viscose 32A"	.....	.36
"Avisco Crimped"	.....	.....
1.25 Denier	.....	.34
3.0 & 5.5 Deniers	.....	.31
8.0 & 15.0 Deniers	.....	.33
"Avisco Super L"	.....	.....
8.0, 15.0 & 22.0 Deniers	.....	.35
Short Staple Blend	.....	.32

## Rayon Tow

Grouped Continuous Filaments (200,000 Total Denier)	.....
1.5, 3.0 & 5.5 Denier Per Filament	.32
9.0 Denier Per Filament	.34
Grouped Continuous Filaments (4400/300 & 2000/1500)	.65

Prices of other descriptions on request.

Terms: Net 30 days.

## Celanese Corp. of America

Current Prices

Rayon Tow		Bright & Dull
1.5, 3, 5 D.P.F.	.....	.32
8 D.P.F.	.....	.34

## Courtaulds (Alabama) Inc.

Effective March 1, 1957

Rayon Staple		Bright	Dull
1 1/2 and 3 denier	.....	\$ .20	\$ .20
Available in 1 1/2", 1-9/16" and 2".	.....	.....	.....

**John J. Wiseman** has been elected president of the Young Men's Board of Trade, Inc., for the year 1957-1958. Mr. Wiseman is with the sales department of Iselin-Jefferson Co., Inc. **William J. Brown, Jr.**, American Surety Co., has become chairman of the board. He was formerly president of the organization. **Richard H. Behrman**, Monroe F. Dreher, Inc., has been elected a director for a term of two years.

**Dr. Hugh M. Brown** has retired from his position as dean of Clemson College. He will devote his efforts to textile and other types of research.

**Fred T. Davies** has been elected vice president in charge of manufacturing for Hightstown Rug Co.

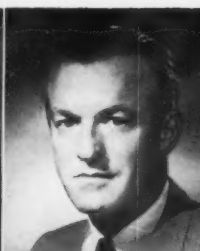


R. D. Wells

**Richard D. Wells** has been appointed assistant director of Fabric Research Laboratories, Inc.



F. C. Mawby



R. A. Rhodes



C. F. Gram

**Boyce C. Bond** has been appointed resident manager for the Philadelphia sales territory of Metro-Atlantic, Inc.



W. A. King

**W. Adrian King** has been appointed general sales manager of Olin Mathieson Chemical Corp.'s Industrial Chemicals Division.

**Peter Bruinooge** has joined the pigment, chemical and color division of Sherwin-Williams Co. as a sales representative in the Middle Atlantic and southern New England states.

**Frank C. Mawby** and **Ralph A. Rhodes** have been elected vice presidents of Bigelow-Sanford Carpet Co., Inc. Mr. Mawby will head the company's Hartford Rayon Division, and Mr. Rhodes will head the Sanford Division.

**Carl F. Gram** has been appointed director of rayon manufacturing for Hartford Rayon Co.

**William H. Shields** has retired from his position as assistant to the research director of Emery Industries, Inc. He spent 32 years with Emery.

## Deaths

**Timothy E. Connor**, formerly a vice president, director and sales manager of Foster Machine Co., died recently at 90. He had retired from the company in 1945.

**James B. Bullitt, Jr.**, director of the research division of DuPont's fabric and finishes department died on May 7th of a heart attack at the age of 51.

# Eliminate broken filaments on Dope-Dyed Nylon with STEIN HALL SUPRANYL

Supranyl possesses unusual adhesion properties for dope-dyed yarn where the normal polyacrylic sizes fail to render adequate loom protection against broken filaments. Light amber in color, it is readily removable in the scouring bath.

\* Above material extracted from Stein Hall Technical Bulletin. Available on request.

**STEIN HALL SUPRANYL\***

**SPECIFICATIONS:**  
**BASE:** Solution of copolymerized organic acids.  
**VISCOSITY:** 800 plus or minus 200 cps. Brookfield at 20°C.  
**pH:** 1  
**ACTIVE INGREDIENTS:** 30% minimum.  
**COLOR:** Clear to light amber.  
**WEIGHT PER GALLON:** 9.6 pounds.  
**MECHANICAL STABILITY:** Very good.  
**STORAGE LIFE:** Minimum 6 months.

**APPLICATION:**  
 In the sizing of dope-dyed nylon yarns, Supranyl is diluted with cold or lukewarm water to a 2-7% concentration, depending upon the twist, denier, number of filaments in the yarn, and construction of the fabric to be woven.  
 Supranyl is the only warp size which adheres properly to dope-dyed nylon and covers the yarn throughout.  
 Supranyl is the only warp size that provides adequate loom protection for dope-dyed nylon as well as natural yarns.

Field tests prove better adhesion for Supranyl than any other dope-dyed filament nylon size. Prove it to yourself. Contact Stein Hall today and our qualified technical salesman will be glad to set up a trial run in your plant.

**STEIN HALL**  
 285 MADISON AVENUE NEW YORK 17, N. Y.

## "Coloray" Spun Dyed Rayon Staple

	1 1/2 Den. 1-9/16"	3 Den. 2"	4 1/2 Den. 2 1/2"	Price per Lb.
(Code numbers for color and denier)				
Black	1404	1419	1425	37¢
Tan	8004	8019	8025	39¢
Medium Brown	8804	8819	8825	39¢
Silver Grey	1004	1019	1025	39¢
Terra Cotta	8204	8219	8225	39¢
Khaki	3004	3019	3025	40¢
Dark Brown	8604	8619	8625	40¢
Slate Grey	0804	0819	0825	43¢
Light Blue	4004	4019	4025	44¢
Sulphur	2004	2019	2025	44¢
Apple Green	5104	5119	5025	45¢
Peacock Blue	4604	4619	4625	46¢
Medium Blue	4204	4219	4225	48¢
Dark Blue	4404	4419	4425	49¢
Hunter Green	5404	5419	5425	49¢
Indian Yellow	2504	2519	2525	49¢
Pink	6004	6019	6025	50¢
Turquoise	4804	4819	4825	50¢
Malachite Green	5204	5219	5225	51¢
Red	7004	7019	7025	56¢

(In addition to the above, Black is also available in:  
1 1/2 den. 1 1/4" (1401) 3 den. 1-9/16" (1416) 4 1/2 den. 2"  
3 den. 1 1/4" (1413) 3 den. 2 1/4" (1420) 4 1/2 den. 4")

Terms: Net 30 days, f.o.b. LeMoyne, Alabama. Minimum transportation allowed to points in U.S.A. east of Mississippi River.

## The Hartford Rayon Co.

Div. Bigelow-Sanford Carpet Co., Inc.

### Rayon Staple

Effective February 8, 1956

#### REGULAR

1.5 denier Bright  
1 1/2" and 2" ..... Withdrawn

#### VISCALON 44

15 denier 3" Dull ..... Withdrawn

#### VISCALON 66 (Crimped)

8 denier 3" Bright ..... 33¢  
15 denier 3" Bright ..... 33¢  
15 denier 3" Dull ..... 33¢

#### "KOLORBON"—Solution Dyed Rayon Staple—3" and 6"

	8 Denier Bright	15 Denier Dull	15 Denier Bright
Cloud Grey	45¢	45¢	....
Sandalwood	45¢	45¢	....
Nutria	45¢	45¢	....
Sea Green	45¢	45¢	....
Mint Green	45¢	45¢	....
Champagne	45¢	45¢	....
Cafe Brown	55¢	....	55¢
Midnight Black	45¢	....	45¢
Gold	45¢	48¢	....
Turquoise	45¢	45¢	....
Melon	45¢	48¢	....
Capri Blue	45¢	45¢	....
Charcoal Grey	45¢	45¢	....
Coco	45¢	46¢	....
Sable	....	....	47¢

Terms: Net 30 days. Prices are quoted f.o.b. shipping point, lowest cost of transportation allowed, or prepaid. To points West of the Mississippi, lowest cost of transportation allowed to the Mississippi River crossing.

## ACETATE STAPLE and TOW

### Celanese Corp. of America

Current Prices

#### Staple

	Bright & Dull
Celanese Acetate Staple	
2, 3, 5.5 & 8 Individual Deniers	\$ .32
12 & 17 Individual Deniers	.33
35 & 50 Individual Deniers	.36
1/2" to 3/4" cut length (all deniers)—Premium	.03
Variable Acetate Fibers	.30
35 Individual Denier Flat Filament Acetate	.38

#### Tow

	Bright & Dull
Celanese Celatow Acetate	
2, 3, 5.5 & 8 Individual Deniers	\$ .34
12 & 17 Individual Deniers	.35
35 & 50 Individual Deniers	.37

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U.S.A. east of the Mississippi River.

Prices subject to change without notice.  
All previous prices withdrawn.

## NON CELLULOSIC YARN NYLON

### Allied Chemical and Dye Corporation

Caprolan®†

Effective April 15, 1957

Denier	Fila- ment	Turn/ in.	Twist	Type**	Package	1st Grade Price/ Lb	2nd Grade Price/ Lb
200	32	1	Z	B	Bobbin	\$1.49	\$1.44
210	32	1	Z	HB	Bobbin	1.49	1.44
560	32	1	Z	HB	Aluminum Tube	1.39	1.29
840	136	1/2	Z	HBT	Aluminum Tube	1.30	1.20
840	136	1/2	Z	HBT	Beams	1.30	1.20

#### Heavy Yarn

						Price/Lb.
2100	408	0	O	HB	Paper Tube*	\$1.27
2100	112	0	O	HB	Paper Tube*	1.30
2500	408	0	O	HB	Paper Tube*	1.27
3360	544	0	O	HB	Paper Tube*	1.26
4200	680	0	O	HB	Paper Tube*	1.26
4200	224	0	O	HB	Paper Tube*	1.29
5000	816	0	O	HB	Paper Tube*	1.25
5000	280	0	O	HB	Paper Tube*	1.28
5800	952	0	O	HB	Paper Tube*	1.25
7500	1224	0	O	HB	Paper Tube*	1.24
10000	1632	0	O	HB	Paper Tube*	1.24
15000	2448	0	O	HB	Paper Tube*	1.23

Terms—Net 30 days.

Prices subject to change without notice.

All prices quoted F.O.B. Shipping Point.

Following are invoiced as a separate item.

Bobbins—45 cents each.

Aluminum Tubes—40 cents each.

Beams—\$220.00 each.

\*Cradles for Beams—\$53.00.

\*Paper Tubes non-returnable, no charge.

\*\*Type is used to describe luster and tenacity

Lowest freight cost prepaid or allowed east of Mississippi River, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

† Allied Chemical's polyamide fiber.

B—Bright.

H—High Tenacity.

T—Heat Stabilized.

## American Enka Corporation

### Nylenka Filament Yarn Prices

Effective December 21, 1956

Denier & Filament	Twist	Luster	Tenacity	Package	Yarn Weight per Package	Price per Pound, Std.	Price per Pound, Sub.
15/1	0.5Z	semi-dull	Normal	Pirn	1 lb.	\$5.25	\$5.00
30/6	0.5Z	semi-dull	Normal	Pirn	2 lb.	2.38	2.21
40/8	0.5Z	semi-dull	Normal	Pirn	2 lb.	2.01	1.81
50/13	0.5Z	semi-dull	Normal	Pirn	2 lb.	1.91	1.76
100/24	0.5Z	semi-dull	Normal	Pirn	2 lb.	1.65	1.60
100/32	0.5Z	semi-dull	Normal	Pirn	2 lb.	1.65	1.60
200/34	0.5Z	bright	Normal	Pirn	2 lb.	1.49	1.44
200/34	0.5Z	bright	Normal	Cone	4 lb.	1.49	1.44
210/34	0.5Z	bright	High	Cone	4 lb.	1.49	1.44
210/34	0.5Z	bright	High	Pirn	2 lb.	1.30	1.20
840/140	0.5Z	bright	High	Cone	4 lb.	1.30	1.20
840/140	0.5Z	bright	High	Beam	—	1.30	1.20

Pirns charged at \$.25 each. Deposit refunded upon return of pirn in good condition. Cones are non-returnable. Beams and cradles are deposit carriers and remain property of American Enka Corporation.

Terms: Net 30 days. Minimum common carrier transportation charges will be prepaid and absorbed to the first destination on or east of the Mississippi River. In prepaying transportation charges, seller reserves the right to select the carrier used.

## The Chemstrand Corp.

Current Prices

Effective December 19, 1956

Denier	Filament	Twist	Type*	Package	Standard	Second
10	1	0	SD	Bobbins	\$8.42	\$7.81
15	1	0	SD	Bobbins	5.25	5.00
15	1	0	D	Bobbins	5.30	5.00
15	1	0	D	Spools	5.41	....
30	10	Z	SD	Bobbins	2.56	2.21
30	26	Z	SD	Bobbins	2.49	2.21
40	7	Z	SD	Bobbins	2.11	1.75
40	13	Z	SD	Bobbins	2.01	1.81
40	13	Z	SD	Spools	2.11	....
40	13	Z	RD	Bobbins	2.06	1.81
40	13	Z	RD	Spools	2.16	....
70	34	Z	SD	Bobbins	1.81	1.76
70	34	Z	SD	Bobbins	1.71	1.66
70	34	Z	B	Bobbins	1.71	1.66
70	34	Z	D	Spools	1.86	....
80	26	Z	SD	Bobbins	1.71	1.56
100	34	Z	SD	Bobbins	1.65	1.60
100	34	Z	HB	Bobbins	1.70	1.60
140	68	Z	SD	Bobbins	1.60	1.55
200	34	Z	B	Bobbins	1.49	1.44
200	68	Z	SD	Bobbins	1.56	1.46
210	34	Z	HB	Bobbins	1.49	1.44
210	34	Z	HB	Spools	1.54	....
210	34	Z	HB	Beams	1.54	....
260	17	Z	HB	Bobbins	1.49	1.39
260	17	Z	HB	Spools	1.54	....
420	68	Z	SD	Bobbins	1.39	1.29
630	102	Z	HB	Bobbins	1.39	1.29
840	136	Z	HB	Tubes	1.34	1.24
840	140	Z	HB	Beams	1.30	1.20
840	140	Z	HB	Tubes	1.30	1.20

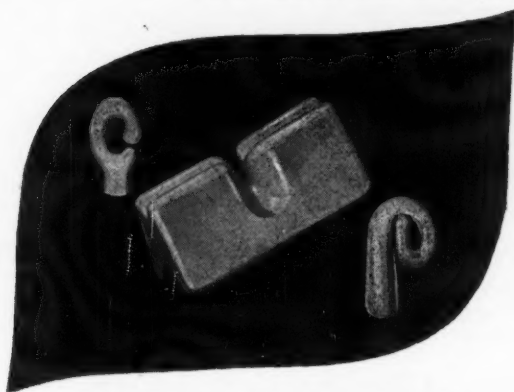
\*Types: D—Dull; SD Semi-dull; B—Bright; H—High tenacity.

Bobbins are invoiced at 25¢ or 45¢ each, depending on type; tubes are invoiced at 40¢ each; spools invoiced at \$77.00 and \$95.00 depending on type; and beams and crates for beams are invoiced at \$220 and \$25 respectively.

Prices subject to change without notice.



*It matters not so much where we stand  
as in which direction we are going.*

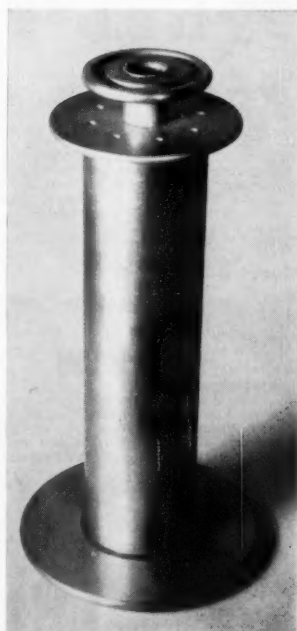


**We who guard the reputation of  
LAMBERTVILLE THREAD GUIDES**

believe that only by directing our research to the perfection of guides that are even harder, smoother and longer wearing, can our company move forward. This philosophy, coupled with the most modern production facilities and exacting inspection standards, is your assurance of guides of the highest quality. Available in white and 'Durablu' finish. Write for catalogue and samples.

**LAMBERTVILLE CERAMIC**  
**AND MANUFACTURING COMPANY**  
**LAMBERTVILLE NEW JERSEY**

**N E W**



**LOW COST  
ALUMINUM  
TWISTER  
BOBBIN**

New aluminum twister bobbin of high strength will not warp or fail despite repeated steamings of highest strength nylon yarns. Of two pound capacity, this new bobbin is dynamically balanced and anodized against corrosion yet is less costly than ordinary bobbins. Spindle guide tube goes all the way through. Grip knob with identification ring simplifies handling without need to touch yarn. Available in a variety of sizes. Write for details today.



**ALLENTOWN BOBBIN WORKS, INC.**  
**ALLENTOWN PENNSYLVANIA**

JULY, 1957



**FOR ORLON SWEATERS**

**"ACRYLITE"**

*THE Modern* **DYEING AGENT**

"ACRYLITE" was especially developed by Leatex to provide an improved dyeing agent for Orlon... the increasingly important **buy**—word for women's sweaters. It has definite advantages which contribute to dyeing quality and economy, among them, the following:

**LEVEL DYEING**—the result of a finer dispersion, evenly absorbed. Eliminates streaking and shading under normal conditions... avoids the necessity for re-dyeing.

**IMPROVED COLOR**—"Acrylite" imparts a degree of lustre... "life"... to the colors, especially the pastel shades.

**ADDED SOFTNESS**—assures a softer "hand" for the fabric... speeds up the softening process.

"ACRYLITE" may be used for either the one- or two-bath procedure... it **scours and dyes in one operation.**

\* Du Pont's Trade-mark for its Acrylic Fibre

Write for complete information on "Acrylite" and other "Leatex" Quality products.



**LEATEX CHEMICAL COMPANY**  
**2724 N. HANCOCK ST., PHILADELPHIA, PA.**

## E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

### Nylon Yarn

Denier & Filament	Turns/Inch & Twist	Type	Package	1st Grade	2nd Grade
7-1	0	200	Bobbin	\$9.47	\$8.82
10-1	0	200	Bobbin	8.42	7.82
12-1	0	200	Bobbin	7.35	6.85
15-1	0	200	Tricot Bms.	5.36	5.00
15-1	0	200	Bobbin	5.25	5.00
15-1	0	680	Tricot Bms.	5.41	5.00
15-1	0	680	Bobbin	5.30	5.00
20-1	0	200	Bobbin	4.42	4.12
20-7	0.5Z	200	Bobbin	2.81	2.61
20-7	0.5Z	200	Tricot Bms.	3.02	2.61
20-7	0.5Z	680	Bobbin	2.96	2.61
20-7	.05	680	Tricot Bms.	3.07	2.61
20-20	0.7Z	209	Bobbin	6.00	2.21
30-10	0.5Z	200	Bobbin	2.36	2.21
30-10	0.5Z	200	Tricot Bms.	2.46	2.21
30-10	0.5Z	680	Bobbin	2.41	2.21
30-10	0.5Z	680	Tricot Bms.	2.51	2.21
30-26	0.5Z	200	Bobbin	2.49	2.21
40-7	0.5Z	200	Bobbin	2.11	1.81
40-13	0.5Z	200	Bobbin	2.01	1.81
40-13	0.5Z	200	Tricot Bms.	2.11	1.81
40-13	0.5Z	400	Bobbin	2.13	1.90
40-13	0.5Z	670/680	Bobbin	2.06	1.81
40-13	0.5Z	670/680	Tricot Bms.	2.16	1.81
40-34	0.5Z	200	Bobbin	2.21	1.81
50-17	0.5Z	200	Bobbin	1.91	1.76
50-17	0.5Z	680	Bobbin	2.01	1.76
70-17	0.5Z	200	Bobbin	1.71	1.66
70-34	0.5Z	100/200	Bobbin	1.71	1.66
70-34	0.5Z	300	Bobbin	1.76	1.66
70-34	0.5Z	680	Bobbin	1.76	1.66
80-26	0.5Z	200	Bobbin	1.71	1.56
100-34	0.5Z	200	Bobbin	1.65	1.60
100-34	0.5Z	300	Bobbin	1.70	1.60
100-34	0.5Z	680	Bobbin	1.70	1.60
100-50	0.5Z	200	Bobbin	1.71	1.60
140-68	0.5Z	200	Bobbin	1.60	1.55
140-68	0.5Z	300	Bobbin	1.65	1.55
200-34	0.7Z	100	Bobbin	1.49	1.44
200-34	0.7Z	680	Bobbin	1.54	1.44
200-68	0.7Z	200	Bobbin	1.44	1.44
210-34	0.7Z	300	Bobbin	1.49	1.44
210-34	0.7Z	300	Beam	1.54	1.44
210-34	0.7Z	330	Bobbin	1.59	1.44
260-17	1Z	100/300	Bobbin	1.40	1.39
400-68	0.7Z	100	Bobbin	1.39	1.29
420-68	1Z	300	Bobbin	1.39	1.29
780-51	0.5Z	300	Bobbin	1.39	1.29
800-140	0.5Z	100	Bobbin	1.39	1.29
840-140	0.5Z	300/700	Al. Tbs/Beam	1.30	1.20

#### Color-Sealed Yarn

Denier & Filament	Turns/Inch & Twist	Type	Package	1st Grade	2nd Grade
70-34	0.5Z	140	Bobbin	\$2.06	\$2.01
200-34	0.7Z	140	Bobbin	1.84	1.79
280-17	1Z	140	Bobbin	1.84	1.79

#### Industrial Yarn

Denier & Filament	Turns/Inch & Twist	Type	Package	1st Grade	2nd Grade
2520-420	0	300/700	Paper Tube	\$1.27	
4200-700	0	300/700	Paper Tube	1.25	
5040-840	0	300/700	Paper Tube	1.25	
7560-1260	0	300/700	Paper Tube	1.24	
10080-1680	0	300/700	Paper Tube	1.24	
15120-2520	0	300/700	Paper Tube	1.23	

These prices are subject to change without notice. Terms: Net 30 Days.

### Types

- Type 100—Bright, normal tenacity.
- Type 140—Bright, color-sealed, black, normal tenacity.
- Type 200—Semidull, normal tenacity.
- Type 209—Semidull, normal tenacity.
- Type 300—Bright, high tenacity.
- Type 400—Semidull, high tenacity.
- Type 670—Dull, normal tenacity.
- Type 680—Dull, normal tenacity.
- Type 700—Bright, high tenacity.

Freight Terms—Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

Following are invoiced as a separate item.

Bobbins—25 cents or 45 cents depending on type

Aluminum Tubes—40 cents each

Tire Cord Beams—\$220.00 each

Cradles for Tire Cord Beams—\$115.00 each

Tricot Beams—\$95.00 each

Cradles for Tricot Beams—\$130.00 each

(Beams and Cradles are deposit carriers and remain the property of E. I. du Pont de Nemours & Co., Inc.)

## POLYESTER E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

### "Dacron"

Denier & Filament	Turns/Inch	Luster	Type*	Tubes 1st Gr.
30-20	0	Dull	57	\$2.86
40-27	0	Semidull	56	2.41
40-27	0	Bright	55	2.41
40-27	0	Dull	57	2.46
70-34	0	Semidull	56	\$2.01
70-14	0	Bright	55	2.01
70-34	0	Bright	55	2.01
70-34	0	Dull	57	2.05
100-34	0	Semidull	56	\$1.94
140-28	0	Bright	55	1.89
150-68	0	Semidull	56	1.91
220-50	0	Bright	51	1.84
250-50	0	Bright	55	1.86
1100-250	0	Semidull	59	\$1.50
1100-250	0	Bright	51	1.50

Terms: Net 30 Days.

Domestic Freight Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

### Yarn Types

\* Type:

Type 51—Bright, high tenacity.

Type 55—Bright, normal tenacity.

Type 56—Semidull, normal tenacity.

Type 57—Dull, normal tenacity.

Type 59—Semidull, high tenacity.

Tubes are invoiced as a separate item at \$.70 each. The only exception to this is an \$.80 charge on the tubes used for 30 Denier Dull. All tubes are returnable for credit.

\* "DACRON" is DuPont's registered trade-mark for its polyester fiber.

## NON CELLULOSIC STAPLE & TOW

### ACRYLIC

#### The Chemstrand Corp.

Current Prices

### "Acrilan"

2.0 denier Semi-dull staple and tow	\$1.18
2.5 denier Hi-Bulk Bright and Semi-dull staple and tow	1.12
3.0 denier Bright & Semi-dull staple and tow	1.12
5.0 denier Bright & Semi-dull staple and tow	1.12
8.0 denier Bright and Semi-dull staple and tow	1.12

Terms: Net 30 days. Freight prepaid to points east of the Mississippi River.

## Carbide and Carbon Chemicals Co.

Div. Union Carbide and Carbon Corp.

Textile Fibers Dept.

Effective November 1, 1955

### Dynel Staple

Natural Dynel	
3, 6, 12, and 24 Denier, Staple and Tow	\$1.05 per lb.
Whitened Dynel, and Dynel Spun with Light Colors: Blonde, or Gray	
3 and 6 Denier, Staple and Tow	1.20 per lb.
Dynel Spun with Dark Colors: Black, Charcoal, and Brown	
3 and 6 Denier, Staple and Tow	1.30 per lb.

Prices are quoted f.o.b. South Charleston, W. Va.

## E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

### "Orlon"\*\*\* Acrylic Staple & Tow

Type 42		1st Grade
1.0 Denier Semidull & Bright—Staple only		\$1.48
2.0 Denier Semidull		1.33
3.0 Denier Semidull & Bright		1.28
3.0 Denier Semidull Color-sealed Black		1.63
6.0 Denier Semidull & Bright		1.20
4.5 Denier Semidull		1.20
10.0 Denier Semidull		1.20

Tow—Total Denier 470,000

Staple Lengths—1½", 2", 2½", 3", 4½"

High Shrinkage Staple same price as Regular Staple

Type 39

This product is designed for woolen system spinning and is a blend of predominately heavy deniers (average 4.2) with a variable cut length.

F.O.B. Shipping Point—Freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

Terms: Net 30 Days.

\*\* "ORLON" is DuPont's registered trade-mark for its acrylic fiber.

## Eastman Chemical Products, Inc.

### Tennessee Eastman Co.

Effective November 15, 1956

### "Verel"\*\*\*

Deniers	Dull and Bright
2, 3, 5 and 8	\$1.10 per pound

Prices are subject to change without notice.  
 Terms: Net 30 days. Payment—U. S. A. dollars.  
 Transportation charges prepaid or allowed to destination in the United States east of the Mississippi River. Seller reserves the right to select route and method of shipment. If buyer requests and seller agrees to a route or method involving higher than lowest rate buyer shall pay the excess of transportation cost and tax.  
 \* "Verel" is a trade-mark of the Eastman Kodak Co.

## NYLON

### American Enka Corp.

#### Nylenka (Nylon Six Staple)

Denier	Luster	Length (Inches)	Price per pound
3	semi-dull	1½, 1½, 2, 2½, 3, 4½	\$1.28
6	bright	3, 4½	1.28
8	bright	2½	1.20
10	bright	3	1.20
15	bright	3	1.20

Deniers and lengths of staple not listed above are available upon special request.

Terms: Net 30 days. Minimum common carrier transportation charges will be prepaid and absorbed to the first destination on or east of the Mississippi River. In prepaying transportation charges, seller reserves the right to select the carrier used.

## Taslan Shirt Fabrics

Shirt fabrics of Taslan textured Dacron polyester fiber, introduced only six months ago, have been added to the shirt lines of 15 manufacturers, according to Du Pont. Taslan textured yarns result from a new bulking process developed by Du Pont. The process can be applied to almost any filament textile yarn and is said to make possible an infinite variety of textures and hand in both knitted and woven fabrics. Du Pont reports the majority of the new shirts generally retail at around \$10 to \$11.

## 'Underwear' Garments

Shelley Sportswear, Inc., Philadelphia, Pa., will produce and sell an estimated 300,000 suits of Wunderwear 100 per cent Dacron fibrefill insulated, lightweight suits for 1957 for Winter wear, according to Joseph Datlof, vice president. Wunderwear is a fabric of 100 per cent virgin Dacron fibrefill quilted into a shell of woven nylon cloth. They are made in 17 different weights and styles for both men and women, and are designed to utilize the body heat within the insulated fabric. Ban-Lon knitted cuffs, neckpiece and ankle cuffs hold the Wunderwear snug and also help absorb any perspiration.

## Urethane Foam Interlining

Nopco Chemical Co., Harrison, N. J., is now marketing its urethane foam interlining material under the trade name of Nopocell. Nopocell, reported to be a lightweight, high tensile and tear-strength cellular material of extremely uniform cell structure, will make its appearance this Fall in a number of outerwear items. Garment-trade sales of Nopocell, formerly called Nopcofoam, are handled exclusively by Sportime Fabrics, Inc.

# Ready!



Famous statue of Revolutionary Minute Man Concord, Mass.

DIAMOND FINISH Rings are in stock in standard sizes, ready to ship in a matter of hours.

Enjoy minute-man service on up-to-the-minute rings!

## WHITINSVILLE (MASS.)

## SPINNING RING CO.

Makers of Spinning and Twister Rings since 1873



Rep. for the Carolinas & Va.: W. K. SHIRLEY, P.O. Box 406, Belmont, N. C.  
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**ASSEMBLY PLATE**  
— Holds internal parts in position when head is removed.

**SELF-SUPPORTING** — Needs no external supports of any kind.

**SYPHON ELBOW**  
— Permits use of straight pipe for syphon. Can be inserted or withdrawn right through the joint.

## WRITE FOR FACTS

on this Series 3000 Johnson Joint and the syphon elbow. Remember Johnson Joints have written an unmatched service record . . . are first choice among mill men and machinery makers alike . . . and can fit all operating needs.

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# SOFTENER

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...pure, white cationic...rich, creamy hand  
...no scorching or discoloring at 350 deg. F.  
for 1 minute...for cottons, nylons, bemberg  
and blends...compatible with acids, resins and  
silicones.

Mill tested technical service  
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**APEX CHEMICAL CO., INC.**  
200 SOUTH FIRST ST., ELIZABETHPORT, N. J.

## E. I. du Pont de Nemours & Co.

Textile Fibers Dept.  
Current Prices

### Nylon Staple and Tow

Denier	Type	Staple Lengths	Tow Bundle	Price/Lb.
1.5	200	1 1/4" - 4 1/2"	None made	\$1.33
1.5	201	1 1/4" - 4 1/2"	None made	1.35
3.0	100/200	1 1/4" - 4 1/2"	430M	1.28
3.0	101/201	1 1/4" - 4 1/2"	455M	1.30
6.0	100	1 1/4" - 4 1/2"	330M	1.28
6.0	101	1 1/4" - 4 1/2"	345M	1.30
15.0	100	1 1/4" - 6 1/2"	330M	1.20
15.0	101	1 1/4" - 6 1/2"	None made	1.22

Staple lengths are restricted to the range shown opposite each denier above. The actual cut lengths within these ranges are as follows:

1 1/4, 1 1/2, 2, 2 1/2, 3, 4 1/2 and 6 1/2

### Types

Type 100 Bright, normal tenacity, not crimpset.  
Type 101 Bright, normal tenacity, crimpset.  
Type 200 Semidull, normal tenacity, not crimpset.  
Type 201 Semidull, normal tenacity, crimpset.  
These prices are subject to changes without notice.  
Terms—Net 30 Days.

Freight Terms—Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

## Industrial Rayon Corp.

Effective November 29, 1956

### Nylon Staple

1.5 denier	\$1.33 per lb.
2, 3 and 6 denier	1.28 per lb.
8 and 15 denier	1.20 per lb.

Bright and semi-dull, required length.

Terms: Net 30 days f.o.b. point of shipment; title to pass to buyer on delivery of goods to carrier. Domestic transportation charges prepaid with transportation allowed at lowest published rate to all points east of the Mississippi River.

## POLYESTER

## E. I. du Pont de Nemours & Co.

Textile Fibers Dept.  
Current Prices

### "Dacron"® Staple and Tow

Denier	Luster	Type	Length	Tow Bundle	1st Gr.
1.25	Semidull	54	1 1/4" - 3"	---	\$1.56
1.5	Semidull	54	1 1/4" - 3"	---	1.51
3.0	Semidull	54	1 1/4" - 4 1/2"	375M- & Tow 500M	1.41
4.5	Semidull	54	1 1/4" - 4 1/2"	375M- & Tow 500M	1.41
6.0	Semidull	54	1 1/4" - 4 1/2"	375M- & Tow 500M	1.41

Terms: Net 30 Days.  
F. O. B. Shipping Point—Freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

## POLYVINYL ACETATE

## American Viscose Corp.

Effective October 1, 1956

### "Vinyon"® Staple

3.0 denier	1/2" unopened	.80 per lb.
3.0 "	1 1/4" unopened	.80 per lb.
3.0 "	1 1/4" opened	.90 per lb.
3.0 "	2" opened	.90 per lb.
3.0 "	2" unopened	.80 per lb.
5.5 "	1" opened	.90 per lb.
5.5 "	3 1/2" opened	.90 per lb.
5.5 "	3 1/2" unopened	.80 per lb.

Terms: Net 30 days.

## PROTEIN

## Virginia-Carolina Chemical Corp.

Fiber Division  
Effective January 15, 1951

### "Vicara" Staple

3 Denier	Standard Crimp	Highly Crimped
3 Denier	\$1.00 per lb.	\$1.05 per lb.
5 Denier	1.00 per lb.	1.05 per lb.
7 Denier	1.00 per lb.	1.05 per lb.

### Bleached "Vicara" Staple

3 Denier	Standard Crimp	Highly Crimped
3 Denier	\$1.10 per lb.	\$1.15 per lb.
5 Denier	1.10 per lb.	1.15 per lb.
7 Denier	1.10 per lb.	1.15 per lb.

Staple length 1/2 to 6 in.  
Supplied in staple lengths or as continuous tow (270,000 filaments).  
Terms: Net 30 days.  
Prices f.o.b. Taftville, Conn. on 10% moisture regain basis.

## New Yarn Process

Universal Winding Co., Providence, R. I., has developed a new process for the manufacture of textured yarn for use in knitted outerwear. The company states that it has been disclosing this new development to their stretch-yarn licensees. The new bulk yarn, called Saaba, is a false twist yarn post-treated on new equipment engineered by Universal over the past year. Basically, the equipment consists of a heat-setting arrangement and a means of controlling the tension on the yarn, so that the yarn can be bulked and plied in one continuous operation. The yarn is reported to perform equally well on jersey, interlock or full-fashioned knitting machines.

## SUPR-O-BAND

Spindle Drive Slippage? Improve your operation and quality with SUPR-O-BAND, the new banding for spindle drives on spinning, roving and twisting frames. Proved by mill operations. Write today for full details.

BENJAMIN BOOTH COMPANY

ALLEGHENY & JANNEY STS., PHILA. 34, PA.

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## COLOR RICHES

top colorfastness...color beauty...  
color uniformity...color versatility

**UNLIMITED** for fabric, apparel,  
home furnishings, everything

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solution-dyed rayon fiber CAPTIVE COLOR

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2 columns to the page, each column 8 inches deep	
1 inch	\$8.00
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5 inches	35.00
6 inches	42.00
7 inches	49.00
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Over 55 Years in Business

## SURPLUS RAYONS, ACETATES and NYLON YARNS WANTED

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**SECTION**

## BUSINESS OPPORTUNITIES

Louis Newmark, Ltd., a well known British firm of precision Engineers and instrument makers (London Area) are desirous of entering into a license agreement, or purchasing outright, patents relating to electrical and/or mechanical devices of a Precision Instrument character or of a consumer goods nature.

Adequate capital and production facilities are available to develop, produce, and market suitable devices. Communications should be addressed to Louis Newmark, Ltd., Purley Way, Croydon, Surrey, England and marked for the attention of Major S. F. N. Neill.

## DACRON, NYLON, RAYON & ACETATE BOUGHT AND SOLD YARNS

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Empire State Bldg. New York City  
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## Make Your Reservations Now!

The Annual Textile Progress Review and Outlook issue of

**MODERN TEXTILES MAGAZINE**

September 1957

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## Calendar of Coming Events

Sep. 4—AATT monthly meeting. Hotel Vanderbilt, New York, N. Y.  
 Sep. 4-6—Fiber Society and Textile Institute meeting. Hotel Statler, Boston, Mass.  
 Sep. 12—AATCC Northern New England Section outing. Wachusett Country Club, W. Boylston, Mass.  
 Sep. 19-20—Textile Quality Control Association fall meeting. Hotel Barringer, Charlotte, N. C.  
 Sep. 25-26—Northern Textile Association annual meeting. Wentworth-by-the-Sea, Portsmouth, N. H.  
 Sep. 26-28—Combed Yarn Spinners Association annual meeting. The Cloister, Sea Island, Ga.  
 Sep. 27—AATCC Delaware Valley and New York Sections joint meetings. Hotel Hildebrecht, Trenton, N. J.  
 Sep. 27-28—Carded Yarn Association annual meeting. The Cloister, Sea Island, Ga.

Sep. 28—Textile Operating Executives of Georgia fall meeting. Georgia Institute of Technology, Atlanta, Ga.  
 Oct. 2—AATT monthly meeting. Hotel Vanderbilt, New York, N. Y.  
 Oct. 2-3—National Cotton Council of American Chemical Finishing Conference. Hotel Statler, Washington, D. C.  
 Oct. 10-11—Southern Textile Methods & Standards Association fall meeting. Clemson House, Clemson, S. C.  
 Oct. 12—Textile Operating Executives of Alabama fall meeting. Thach Auditorium, Auburn, Ala.  
 Oct. 28-31—National Industrial Packaging and Handling Exposition. Convention Hall, Atlantic City, N. J.  
 Nov. 6—AATT monthly meeting. Hotel Vanderbilt, New York, N. Y.  
 Nov. 14-16—AATCC National Convention and Exhibition. Hotel Statler, Boston, Mass.

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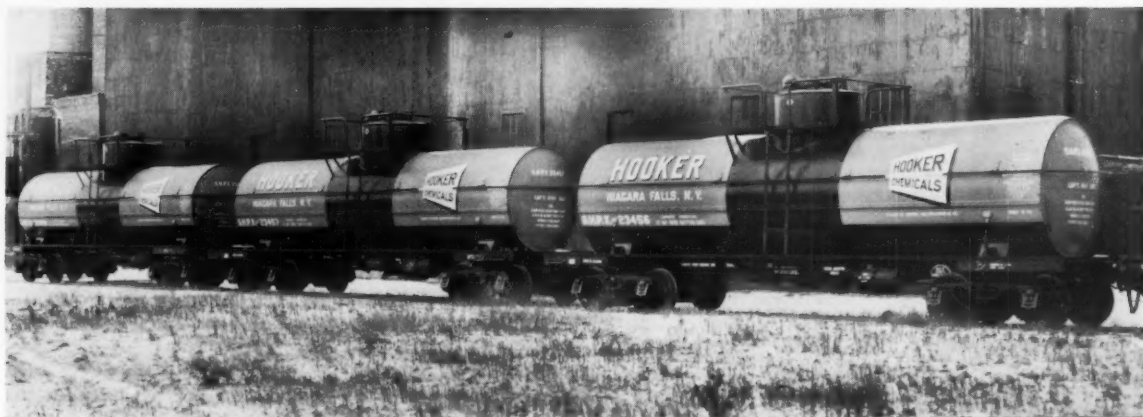
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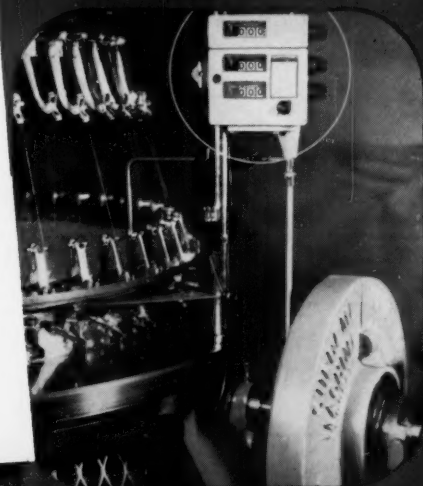


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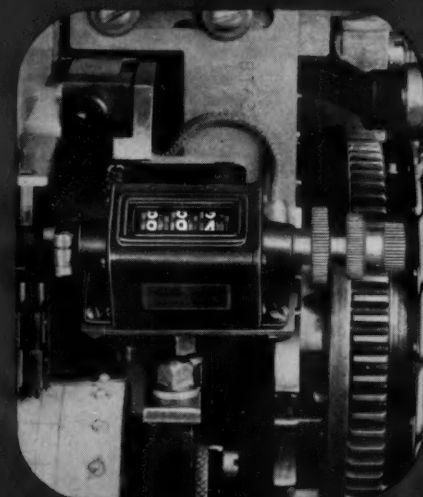
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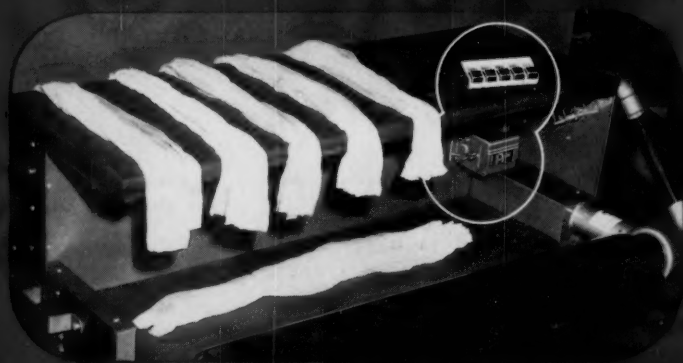
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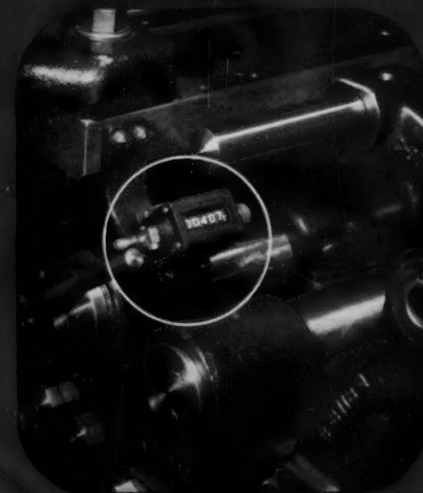
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